CARPENTER'S GEOGRAPHICAL READER

No 47

PUBLIC SCHOOL LIBRARY

Minerva Township

MARSHALL COUNTY, IOWA

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(b) For the loss of a volume, the cost of the book, and for one of a set, an amount sufficient to purchase a new set.

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NORTH AMERICA
SCALE OF MILES
0 500 1000
ARCTIC OCEAN
GREENLAND
BERING SEA
ALASKA
Yukon R.
DOMINION OF CANADA
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Columbia R.
Mississippi R.
St. Lawrence R.
Ohio R.
UNITED STATES
ATLANTIC OCEAN
PACIFIC OCEAN
ROCKY MTNS.
TROPIC OF CANCER
GULF OF MEXICO
MEXICO
WEST INDIES
CARIBBEAN SEA
CENTRAL AMERICA
SOUTH AMERICA
ARCTIC CIRCLE
120 Longitude 110 West 100 from 90 Greenwich 80 70

CARPENTER'S GEOGRAPHICAL READER

NORTH AMERICA

BY

FRANK G. CARPENTER

NEW YORK ·:· CINCINNATI ·:· CHICAGO
AMERICAN BOOK COMPANY

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PREFACE.

THE purpose of this book is to give to its readers a living knowledge of some of the wonders of the country and continent in which they live. Upon a personally conducted tour they are taken by the author through the most characteristic parts of the North American continent. They travel through the United States, British America, Mexico, and Central America, studying the most interesting features of life and work among the people of each country, learning how they are governed, and what they do in order to live. Much information is also given concerning the natural resources and the physical features of the countries visited.

The greater part of the journey is taken in the United States. Here the young Americans learn what makes us a great nation, and see for themselves the sources of our national wealth. They visit our chief cities. They go through the cotton and tobacco plantations of the South, linger under the orange groves of Florida, and spend some time among the vast corn and bread lands of the North. They travel over the plains. They go down into the mines and see how coal, iron, copper, gold, and silver are taken out of the depths of the earth and turned to the use of man. They spend days in the forests visiting the lum-

ber camps and hunting for game. They see the great natural wonders of our country, now stopping awhile at Niagara Falls, now drifting down through the Grand Canyon of the Colorado, now resting under the shadow of the big trees of California, and later on wandering about among the wonderful geysers of the Yellowstone Park.

From Puget Sound they sail north to Alaska, the land of ice, gold, and seals, and thence travel up the Yukon River and over the frozen plains to the Mackenzie. After exploring the great fur lands of the northern part of our continent, they return southward and visit the settled parts of Canada, including its capital and its other great cities.

From Halifax they take ship for Mexico, going almost directly from the cold lands of the North to the semi-tropical regions of our sister republic. They ascend Popocatepetl, travel over the Mexican plateau, and then, after a journey through Central America, close the tour at the Isthmus of Panama, and sail for New York.

These imaginary tours which the children make will, it is believed, not only give them much valuable information of a practical character, but will inspire them with intelligent patriotic motives and with a commendable pride in our country's institutions. Used as a supplementary reader in connection with the geographies studied at school, the book will aid in imparting a living interest to the lessons therein contained, and will be found to be a valuable aid in explaining and fixing in the mind many interesting facts which might otherwise be but imperfectly apprehended.

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TRAVELS THROUGH

NORTH AMERICA.

I. GENERAL VIEW OF NORTH AMERICA.

WE start to-day upon our travels through the North American continent. We are about to explore one of the most wonderful of the grand divisions of the globe. It is that part of the earth upon which we live, and the most of our time will be spent in the vast region known as the United States, which we are proud to call our own country.

What would you think of a farmer who did not know his own farm, or what he had on it? A wise landowner will know just where the boundaries of his possessions are and what line fences separate him from his neighbors. He will know every hill and valley, every pond and stream. He will go through the woods to see if there is any game, and will drop his fishing line into the different streams and ponds to learn about the fish. He will try to know just what kind of crop each field will produce, and he will learn over what roads he can most easily carry his crops to market. Perhaps he will dig in the hills to learn if they contain coal, iron, or copper; and if any one tells him there

is gold or silver on his farm, you may be sure he will not rest until he knows just where it is. He will ask all sorts of questions about his neighbors — what kind of people they are, and just how they live; and he will not stop until he knows something about everything that is going on around him.

Now the boys and girls of this country, together with their parents, are the owners of a vast tract of land known as the "United States." It is in the grand division of North America; and all of its possessors, being sensible persons, are interested in learning whatever is to be known of its resources, its various advantages, and its immediate surroundings. This is indeed what we shall try to learn in the travels that we are about to describe in this book.

Before we start let us take a bird's-eye view of the country. Suppose, for a moment, that we can take a trip to the moon, and suppose we have there a telescope so powerful that we can see the whole world; what sort of a picture does our continent make when thus spread out before us?

We see that North and South America are two vast peninsulas, each almost surrounded by water. North America is the larger. And the narrow Isthmus of Panama, with its luxuriant vegetation, looks like a green chain connecting the two.

Should we attempt to draw straight lines about North America, we should find that the land lies almost in the shape of a triangle, the northern and eastern sides of which are of much the same length. Upon each of these two sides we might see a great silvery spot where the waters from the ocean extend into the land. That on the north lies just below about the middle of the line, and is known as Hudson Bay; while that on the east lies near the foot

of the line at the south, and is the Gulf of Mexico, with the green island of Cuba bordering its edge.

As we stand upon the moon we may take a rapid glance about the coast of this vast country. There, at the northwest, is Bering Strait, a thin line of silvery water only sixty miles wide, which separates North America from Asia. Starting from this, our eyes travel southward, along the western coast of Alaska, the Dominion of Canada, the United States, Mexico, and Central America, to the Isthmus of Panama. Here we cross, and, turning to the left, we follow the coast of the Caribbean Sea and the Gulf of Mexico. Reaching the Atlantic Ocean at the southern point of Florida, we follow its shore line until we pass New York and New England. Farther north we notice the rocky coasts of Newfoundland and Labrador; and then our eyes, dazzled by the snow, roam among the icebergs of the Arctic Ocean until at last they rest again upon our starting point in Bering Strait.

Such a view shows us something of the vast extent of North America. The line about the coast is nowhere regular; it has many capes, bays, and gulfs; and could we measure its windings, we should find that it is almost as long as the entire distance round the earth.

Within this coast line lies about one sixth of all the dry land on the globe. North America is, in fact, the third in size among the grand divisions of the earth. It is more than twice as big as Europe, and the only grand divisions which surpass it in area are Asia and Africa.

As we look down upon it we see that the most of North America is made up of plains, and that in general it consists of a great central valley, or trough, running from north to south between high lands and long mountain ranges. The green Appalachians, a little back from the Atlantic

Ocean, form the eastern side of the trough; far away in the west are the wide plateaus and the lofty, snow-clad peaks of the Rocky Mountain highland; while between these mountain regions lie the central plains of the

Scene in the Rocky Mountains.

Mississippi, the Saskatchewan, and the Mackenzie rivers. These plains reach from the Gulf of Mexico to Hudson Bay and the Arctic Ocean, and form one of the largest valleys of the earth.

Halfway up this valley, near the Great Lakes, the land rises slightly so as to form the water parting called the Height of Land. North of this divide the streams flow to the northeast and north, and empty themselves into the cold waters of Hudson Bay or of the Arctic Ocean. South of it they flow to the south and are lost in the warm Gulf of Mexico. The slopes of the valley in both directions, however, are so slight that one may go through it from the Gulf of Mexico to the Arctic Ocean without perceiving that he is going up or down hill.

But let us fix the telescope directly upon our own country. There is the United States, lying in the middle of the continent. The broad lands north of it are the Dominion of Canada, while south of it are Mexico and Central America, extending like a handle to the great body of the continent.

Think of it! All of that land between Mexico and the Dominion of Canada belongs to us. What a big country it is! It is so wide from east to west that it takes more than five days and nights on a fast railroad train to cross it; and its average length from north to south is thirteen hundred miles. The United States is one of the largest countries in the world, and, with the territory of Alaska, it contains almost as much land as all Europe.

The United States is a very rich country. Those mountains on its eastern edge contain millions of tons of iron, and thousands of men are now digging in them to get out the ore. Among the same mountains are vast fields of coal, and the streams which flow down the hill slopes furnish water power for thousands of factories.

The Rocky Mountain highland, in the western part of the country, contains vast quantities of gold, silver, copper, and lead, and we shall see the miners taking the metals out of the hills. There are many wild animals among these mountains, and during our tour we shall have splendid hunting and fishing.

Between the eastern mountains and this great mountain plateau of the West lies one of the most fertile valleys of the world. See those silvery lines which wind their way through it, as we look down upon it from the moon. They look like threads at this distance, but they are really great rivers, and all parts of the valley through which they flow are well-watered lands. That valley is the Mississippi

Valley, and the band of silver which runs through it from north to south is the Mississippi River, which, with its great branch the Missouri, is the longest river in the world.

But what are those patches of silver west of the Appalachians? They look quite large as they lie there below us. Those are the Great Lakes, the biggest bodies of fresh water on the globe. They are so big that they seem like seas, and when we travel upon them we shall often be out of sight of land.

The United States is a country of homes. Its valleys and plains are dotted with cities and towns, and are covered with a network of black lines. Those lines are the railroads. The United States has more railroads than any other country on the globe.

It is one of the busiest lands on the earth. It now contains more than seventy millions of people, and these are engaged in so many different kinds of work that, as our eyes move over the land, we seem almost to hear the hum of the machinery, away up here on the moon. It is indeed an interesting land, and we ought to be proud that we can call it our country. It is so vast that we hardly know where to begin to explore it. But there in the East is its capital, the city of Washington, and from there we shall start.

II. IN OUR NATIONAL CAPITAL.

IT seems strange that our national capital should be so far away from the center of the United States. You would think it ought to be in the Mississippi Valley, about halfway between the Dominion of Canada and the Gulf of Mexico. It is on the Potomac River, about a hundred

miles from its mouth, and only a short distance from the Atlantic coast. It is on the eastern side of the Appalachian Mountains, a long way from the Mississippi Valley, and thousands of miles from the lofty plateaus of the West. The inhabitants of Oregon, California, and Washington have to travel almost three thousand miles if they would see the President, and, indeed, most of our people are many hundreds of miles away from their capital.

The Old City of Washington.

Now the capital of a country is where the chief officers of its government live and do business, and many of the people who have business with the government must go to the capital. If it were not for the railroads, this, for many of us, would be quite inconvenient; and were it not for the telegraph and telephone it would be almost impossible to govern well such a large country from a capital so situated.

120
110
Longitude
100
C. Flattery
Vancouver
Victoria
Puget Sd.
Seattle
Spokane R.
WASHINGTON
Astoria
Portland
Walla Walla
OREGON
Columbia R.
Salem
C. Blanco
Roseburg
Baker City
Silver City
Boise
Idaho
Snake R.
Great Falls
Missouri R.
Helena
Butte
Bozeman
Yellowstone R.
MONTANA
Yellowstone National Park
Deadwood
WYOMING
South Pass
Green R.
Elko
Great Salt L.
Salt Lake City
Cheyenne
Platte R.
NEBRASKA
Kearney
Longs Peak
Denver
Republican R.
COLORADO
Pikes Peak
Colorado Spgs.
Pueblo
Arkansas R.
Dodge City
KANSAS
OKLAHOMA
Canadian R.
Santa Fé
Albuquerque
NEW MEXICO
Silver City
Pecos R.
Ft. Worth
TEXAS
El Paso
Juarez
Rio Grande
Colorado R.
San Antonio
Brownsville
Chihuahua
Guaymas
SIERRA MADRE
Zacatecas
C. Mendocino
San Francisco
Monterey
Pt. Conception
SIERRA NEVADA MTS.
CASCADE RANGE
Pioche
Carson City
Sacramento
Los Angeles
San Diego
Santa Barbara Is.
Prescott
ARIZONA
Phoenix
Gila R.
Yuma
Tucson
Colorado R.
PACIFIC OCEAN
GULF OF CALIFORNIA
Lower California
C. San Lucas
UNITED STATES
MEXICO
DOMINION
Lake Winnipegosis
Lake Manitoba
Winnipeg
Saskatchewan R.
Pembina
NORTH DAKOTA
BISMARCK
SOUTH DAKOTA
PIERRE
Sioux
SCALE OF MILES
0 50 100 200 300 400
40
30
43
33
Longitude
West
23

West 90 from 80 Greenwich 70
HUDSON B.
Albany
C A N A D A
Lake Nipigon
L. St. John
Quebec
QUEBEC
St. Lawrence R.
GULF OF ST. LAWRENCE
NEW BRUNSWICK
St. John
NOVA SCOTIA
Halifax
Lake of the Woods
Rainy L.
Red L.
SUPERIOR L.
Ottawa R.
Montreal
MAINE
AUGUSTA
Portland
C. Sable
Duluth
Superior
Georgian Bay
ONTARIO L.
OTTAWA
CONCORD
BOSTON
C. Cod
MICHIGAN L.
HURON L.
Toronto
ONTARIO
OSWEGO
ALBANY
MASS.
CONN.
New York
40
WISCONSIN
La Crosse
Milwaukee
MADISON
LANSING
Detroit
Bay City
Buffalo
Erie
L. ERIE
NEW YORK
Cleveland
PENNSYLVANIA
Chicago
Joliet
Toledo
Akron
Pittsburg
HARRISBURG
Philadelphia
Peoria
Ft. Wayne
OHIO
Baltimore
C. May
Burlington
ILLINOIS
INDIANA
COLUMBUS
W. VIRGINIA
WASHINGTON
DEL.
Quincy
SPRINGFIELD
INDIANAPOLIS
Cincinnati
CHARLESTON
RICHMOND
Kansas City
St. Louis
Louisville
FRANKFORT
VIRGINIA
Springfield
Evansville
Ohio R.
KENTUCKY
Norfolk
Cairo
Cumberland R.
RALEIGH
C. Hatteras
NASHVILLE
N. CAROLINA
Ft. Smith
TENNESSEE
Memphis
Chattanooga
Clarlotte
Wilmington
ARKANSAS
LITTLE ROCK
Tennessee R.
S. CAROLINA
COLUMBIA
C. Fear
Aberdeen
ATLANTA
Macon
Charleston
Birmingham
ALABAMA
GEORGIA
Savannah
Selma
MONTGOMERY
Vicksburg
JACKSON
Brunswick
Natchez
Mobile
Jacksonville
BATON ROUGE
TALLAHASSEE
St. Augustine
New Orleans
Cedar Keys
C. Canaveral
Galveston
Tampa
ATLANTIC OCEAN
GULF OF MEXICO
BAHAMA ISLANDS
Nassau
ANDROS IS.
C. Sable
Key West
FLORIDA STR.
TROPIC OF CANCER
HAVANA
CUBA
Puerto Principe
30
Washington 13 3

But why was the capital located so far from the center of the United States?

The story is connected with the growth of our country. When the Americans, in the Revolutionary War, forced England to allow them to govern themselves, there were but few people in our country, and it was not thought that the United States would ever extend so far westward. The most of our people then lived east of the Appalachian Mountains. The lands to the westward were filled with wild Indians, and deer and bears roamed through the dense forests. We did not then own any land beyond the Mississippi River, and the site of Washington city was almost in the center of the inhabited country; so when a location for the capital of the new government had to be chosen, this was thought to be the best place.

Congress was then sitting in Philadelphia. It was before the days of railroads, and President Washington came in a carriage to the village of Georgetown, which is now a part of the capital, and arranged with the farmers to sell their lands to the government. Soon after this the work of laying out the city began; but it was almost ten years before the White House was finished and a building put up on Capitol Hill in which Congress could come together to make laws.

The first President who lived in Washington was John Adams. He came alone to the capital, leaving his wife to follow him. In doing so, she lost her way in traveling through the woods from Baltimore to Washington, and in one of her letters she says she rode for miles without seeing a human being.

At this time a large part of Washington stood in the woods. There were stumps in some of the chief streets, and in wet weather Pennsylvania Avenue was almost a

river of mud. The congressmen and other officials did not like the new capital. For a long time they nicknamed it by such titles as the "Wilderness City," the "City of Miserable Huts," and the "City of Streets without Houses." It steadily grew, however, and it now contains more than a quarter of a million of people, and is said by travelers to be the finest capital city in the world.

General View of Washington at the Present Time.

The plan of Washington is a beautiful one. From the Capitol building as a center, the city is laid out in four great parts, in each of which the streets cross one another at right angles, making them look as if four checkerboards had been there joined together. Through the checkerboards, running in all directions, there are wide avenues,

and where these avenues cut through the streets there are circular and triangular parks. The circles and triangles are filled with statues, fountains, flowers, and trees, and they form one of the chief beauties of the city.

One of the Small Parks in Washington.

Why were these little parks so placed?

It was not so much for beauty as for defense. The man who planned Washington was a Frenchman, Major Pierre l'Enfant, who had left Paris about the time of the French Revolution, when the mobs were destroying the government. In laying out our capital he had the bloody scenes of Paris in his mind, and he planned a city which he thought could be easily defended and at the same time be beautiful. Each of the little parks controls several streets,

and a cannon placed in its center could be turned around and thus fire shot down a half-dozen different streets.

We shall take bicycles for our tour through the city. Washington has more than two hundred miles of streets that are almost as smooth as a floor. They are paved with gray asphalt, and are lined with shade trees whose branches often meet overhead, forming long arbors of maples and magnificent elms. The city seems to be built in a forest, with long lines of houses rising out of the trees. Along the streets back of the sidewalks are wide strips of green lawn which extend up to the walls of the houses.

The Library of Congress.

We devote our first day to a run about the city. The great government buildings are often far apart, and it is a full mile from the White House to the Capitol, which is situated on a high hill to the eastward.

Farther on we come to the National Library building,

which is the most beautiful public building in the United States. It covers nearly four acres of ground, and its great golden dome, as big as the largest circus tent, can be seen shining in the sunlight for many miles about Washington.

Leaving the library, we ride a mile farther to the navy-yard, on the eastern branch of the Potomac. We are allowed to pass in by the soldiers guarding the gate, and we

The Smithsonian Institution.

visit the foundries where the great guns for our battle ships are made. We next go to the arsenal to watch the parade of some of the companies of soldiers who are here to guard our capital city. Then we go back to the White House through the long park known as the Mall, which lies south of Pennsylvania Avenue. This park is filled with beautiful trees, under the branches of which we ride as we pass the red brick building of the National Museum,

wheel by the great brownstone castle-like Smithsonian Institution, and go out among the beautiful flower beds back of which stand the offices and greenhouses of the Agricultural Department.

A little farther on, we leave the trees and enter a large green field, one edge of which is washed by the waters of the Potomac River, and here we see the high monument built in memory of George Washington.

The Washington Monument may be seen from any part of the city. At a long distance it looks like a big piece of chalk with a well-sharpened point. It seems to grow as we come toward it. It gets bigger and bigger, and as we walk up the little hill on the bank of the Potomac where it stands, and put our chins against its side, and look up, it appears to be a huge marble wall built right up into the sky.

Washington Monument

The monument is made of hundreds of blocks of marble, so closely joined together that you can hardly see where one stone fits

into another. It is fifty-five feet square at the base, and slopes upward so gradually that, if you could slice off the top where the shaft begins to slope to a point, you could build there a house with four large rooms on each floor, and the edges of the house would not be outside the monument.

The inside of this huge structure is hollow. There is an elevator in it, and as we ride to the top the man in charge tells us that the Washington Monument is the highest stone structure in the world.

As we stand again at the foot of this monument and look toward the north, we face three of our chief government buildings. There, at the left, is the huge granite structure occupied by the State, War, and Navy Departments; at the right is the somber gray Treasury Department, where much of our national money is kept; and in the center shines out the White House, where the President lives.

We look at our watches, however, and find that it is too late to do more to-day. It is almost four o'clock, and the government offices are ready to close.

As we reach the Treasury building a mass of men and women pours forth from each of the doors which face Pennsylvania Avenue. At the same time the other departments of the government dismiss their employees, and the streets are almost blocked with clerks on their way home from work.

We find that it takes a vast number of people to do the public business of the United States, and we are told that more than twenty thousand persons are needed to keep the books and carry on the national business at Washington.

III. A VISIT TO THE PRESIDENT AND TO THE HALLS OF CONGRESS.

OUR first trip to-day will be to the White House. We are to meet the President of the United States. After that we shall go to the Capitol and see something of Congress and the Supreme Court.

Our government is made up of three branches: the legislative branch, or Congress, which makes the laws; the executive branch, consisting of the President and his officials, which carries out the laws; and the judicial branch, or the courts, established in order to define the meaning of the laws. The President is called the Chief Executive of the United States. He is, in fact, our chief business manager. He is elected for a term of four years, and he receives a salary of fifty thousand dollars a year.

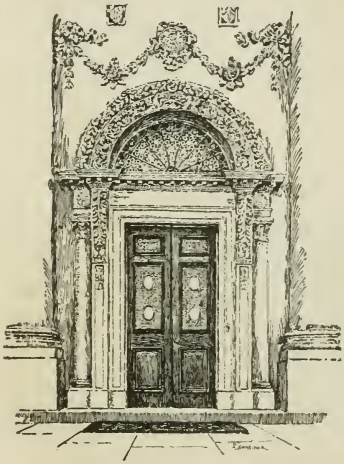
The White House.

We walk up past the Treasury, and soon come to the iron gates which form one of the entrances to the White House grounds. The gates are wide open, and any one may go in. We walk undisturbed up the roadway which leads to the great porch before the front door.

Here we stop to take a good look at the White House

before we enter. It is made of sandstone, but is so painted that as you view it from the street it looks like a marble palace shining among the huge forest trees which surround it. A lawn of velvety green lies between it and the street, and on our way in we go by a fountain which sends thousands of silvery drops high into the air.

The doors before us are of polished mahogany, and each of the two big brass knobs upon them bears the figure of the American eagle. Now the doors are opened, and a messenger asks us to enter. We take a few steps and are inside the White House, in the home of the President of the United States.



Front Door of the White House.

The first room we see gives us an idea of the great size of the building. It is known as the Vestibule; but it is four times as big as an ordinary parlor, and is in some ways so splendid that it makes us think of the cave of Aladdin.

The wall at the back seems to be made of jewels and precious stones. It consists of little pieces of colored glass, of all shapes and sizes, fitted together so that they form a combination of all the colors of the rainbow. This wall was made for the White House by one of the noted jewelers of our country. It cost thousands of dollars, but one old lady who looked at it not long ago thought it was cheap. As she saw the many colored pieces of glass she said she was glad that the President was so economical that

he was trying to save the people's money by making the walls of his house of old broken bottles. "And it's real pretty, too," the woman said, "and you wouldn't think it was homemade."

Turning to the left through this hall, we first visit the East Room. This is one of the largest parlors in the United States. It takes up the whole east side of the White House. Its ceiling is three times as high as that of the average schoolroom, and its floor is so big that it requires more than four hundred yards of carpet to cover it. The carpet is of velvet, and so soft that our feet sink down into it as we walk through the room.

The walls of the East Room are painted in silver and gold. From its ceiling hang wonderful silver chandeliers, upon each of which are thousands of pieces of cut glass. In the walls are set eight great mirrors, each as big as the largest store window, in which, when the chandeliers are lighted for the President's evening parties, the glass pendants shine like diamonds. At such times there are great banks of cut flowers below the mirrors, and flowers and ferns are wreathed throughout every part of the vast room. There are palm trees and tropical plants in the corners and in the windows. The parlor is then filled with gaily dressed people, and the whole makes you think of fairyland.

At the end of the East Room we enter a parlor furnished in green and silver, known as the Green Room, and from this go into the famous Blue Room, where the President stands, with his wife, and shakes hands with those who come to his evening receptions. The Blue Room is oval in shape. Its furniture is of wood covered with gold leaf, and cushioned with satin fine enough for the dress of a queen.

Farther on is a room the walls of which are decorated with red satin; it is known as the Red Room; and beyond

it is the state dining room, where the President gives his state dinners to the highest officials and other famous people. We visit the conservatory, where there are so many kinds of flowers and beautiful plants that we feel we could linger all day among them; but soon the messenger comes and tells us the President is ready to see us.

The President's Office.

He takes us upstairs, and opens the door of the President's office, and a moment later we are standing in front of the Chief Executive of the United States. He rises and offers his hand, and we are somewhat surprised to find that he is not very different from the other men we have known. He probably remembers that he was once a little child, too. He treats us kindly, and chats with us for a few moments about himself and his duties.

The President has much work to do. He is kept busy from daylight to dark directing the affairs of the government. He has a vast number of officials under him, both here and in all parts of the country; and as we go out we hear the click, click, click of a telegraph instrument, and are told that an operator is kept in the White House to send out the President's orders to all parts of the United States.

The Capitol.

Later on we are shown the Cabinet Room, where, three times a week, the President advises with the men who preside over the different departments of the government. Here he discusses with them a vast amount of perplexing business; and we learn that it is a great task to be the ruler of a country so large as the United States.

Now let us leave the White House and make our way down Pennsylvania Avenue to the national Capitol.

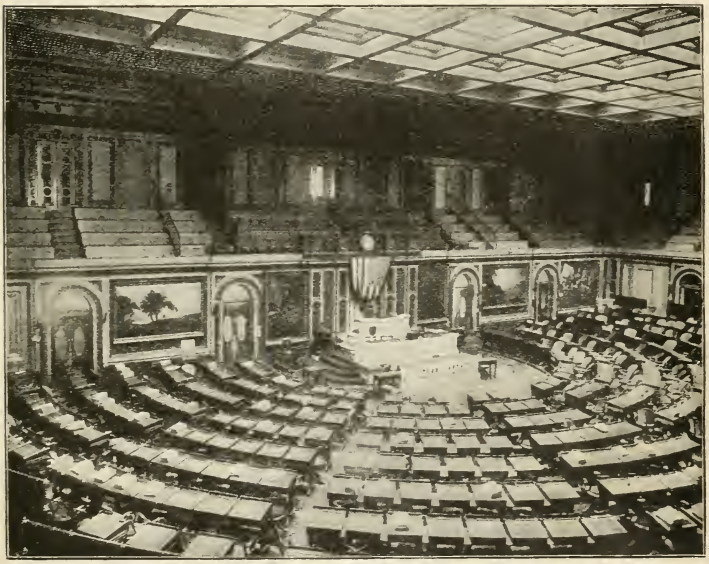
What a beautiful building it is! As we ride into the park which surrounds it, it appears like a huge marble palace with a great white dome floating, as it were, in the blue sky. As we come nearer the building grows larger and larger, and we believe what the guide tells us, that it is not only one of the most beautiful, but also the largest building of its kind in the world. It covers three and one half acres of ground, and it has so many rooms that there are parts of it in which we might get lost and wander about a long time without finding our way out.

Entering the Capitol, we find its rooms swarming with people. It is a city in itself, the chief business of which is to make laws for our nation. The two great lawmaking bodies are at the opposite ends of the building. In the south wing is the hall of the House of Representatives, and in the north is the chamber of the United States Senate, while a wide corridor runs through the building from the one to the other.

We enter at the House side, and, pushing our way through the crowds, soon find ourselves in the gallery of the biggest legislative hall in the world. We are in the hall of the House of Representatives. The floor below us is so large that it could be divided into twenty-eight parlors, each sixteen feet square. The ceiling is so high above the floor that six of the tallest men might stand one on the head of the other within this room, and if the stockings of the first man rested upon the floor the hair of the sixth would just graze the ceiling. Below the ceiling, running all round the room, are banks of galleries which begin at the edge of a great central pit and slope upward to the walls.

As we sit in the galleries we can look down into this pit upon our representatives in Congress at work. Each has

a desk much like a school desk before him, and the scene makes us think of a schoolroom, in which the Speaker of the House has the place of the teacher. The desks run in the shape of a half-moon round a high platform at one side of the hall. Upon the platform there is a marble pulpit,



The Hall of the House of Representatives.

with the American eagle hanging out from the wall above it. This pulpit is the Speaker's desk, and the man who sits behind it, with that ivory-headed mallet in his hand, is the Speaker of the House, who keeps order and says what shall be done.

But who are the little boys with the silver badges about the size of a half-dollar on their coats, who are running to and fro with letters and papers in their hands? They do

not seem to be more than twelve or fifteen years of age. Those are the pages of Congress; they run errands for the congressmen; and each receives two dollars and fifty cents a day for his work. When a congressman wants a boy he claps his hands, and the boys run to him from their seats on the steps of the Speaker's platform to get his orders. We shall find other boys doing the same work in the Senate.

A Page.

But just what do the representatives do?

In connection with the Senate, they make the laws to govern this big country of ours, and no national law can be enforced until a majority of the representatives and senators have voted for it and it has been approved by the President.

But how do they become congressmen?

The people of the United States choose the representatives. The states are divided into congressional districts, each containing about the same number of people. Each district has the right to one member of Congress, and its people choose who he shall be.

And are the senators chosen in the same way?

No; they are elected by the different state legislatures. Every state has the right to two senators, and little Rhode Island has just as many senators as Texas, which is more than two hundred times as big.

Each senator and each representative gets a salary of five thousand dollars a year; but the representatives are elected for only two years, while the senators are chosen for six. The representatives choose their own Speaker, or presiding officer; but the presiding officer of the Senate is the Vice-President of the United States.

But let us now leave Congress and take a look at the Supreme Court. We push our way through the crowds about the doors of the House of Representatives, and go on into a beautiful hall filled with the marble statues of some of the greatest men of our history.

We pass through the rotunda, or great circular room above which the dome rests, and go on into the chief passageway between the hall of Representatives and the Senate chamber.

Here we are stopped by a messenger while a curious procession crosses the hall. It consists of nine men in long gowns of black silk. How dignified they seem, and how quiet every one is as they go by! Those are the Supreme Court justices. They are the heads of the judicial branch of our government, and are on their way to the court room.

Now they have passed, and we can go into the same room, though by another door. We enter just in time to hear the marshal of the court cry out:

"Oyez! oyez! oyez! All persons having business before the honorable Supreme Court are admonished to draw near and give their attention. The court is now sitting. God save the United States and this honorable court!"

He sings this out in loud tones, running the words together into one sentence, and saying them all in one breath.

As he does so the justices are seating themselves behind a long mahogany table on a platform at the back of the room, their armchairs resting against columns of black-and-gray marble. The chief justice is in the center. His chair is under a purple canopy, out of which a golden American eagle, holding in its beak a strip of metal, upon which are painted the words, "In God we trust," looks down with fierce eyes upon him.

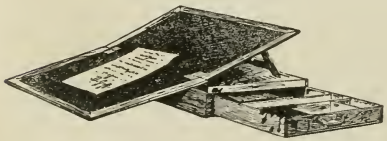
The lawyers and people who have business before the Supreme Court are seated in a little inclosure below the bench. Back of them, against the wall, sit the visitors, including ourselves.

It is usually very quiet in the Supreme Court, for this is the most dignified branch of our government. It is so quiet to-day, in fact, that we find ourselves almost going to sleep after our hard day's sight-seeing. We are frightened as we catch ourselves nodding, and we rise, and slip gently out, and make our way back to our hotel.

IV. THE DEPARTMENTS OF THE GOVERNMENT.

THIS is our last day in Washington. There is so much more to be seen that we hardly know where to begin. We first visit the big granite building containing the State, War, and Navy departments.

The State Department has charge of the business between the United States and foreign nations. Its offices take up the south end of the building. Here all our treaties, or contracts with other nations, and our most important state papers are kept. In the library we see the original Declaration of Independence, and also the little mahogany desk upon which Thomas Jefferson wrote it. This desk is so small that you could easily take it on your lap. It has little drawers in it for pens and writing



Jefferson's Desk.

materials; and upon lifting the lid, we see pasted upon its under side a note in President Jefferson's own handwriting, stating that it was upon this desk that he penned that famous paper.

But who are those queer-looking people we see as we go through the halls?

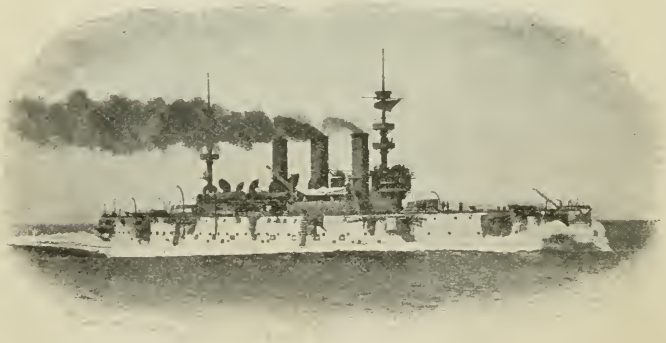
They wear long gowns of bright-colored silk, and upon their heads are odd hats of black horsehair. They have yellow faces and queerly shaped eyes. They cannot be.

The State, War, and Navy Building.

women, for they have whiskers, and we have never seen men like them before. They are the Korean minister and two of his clerks. They have come to call upon the Secretary of State about some matter of dispute between their

country and ours. If we wait here very long we may possibly see the Chinese minister or the Russian minister come in. All the great nations of the world send men to our capital to attend to the business which their governments have with the government of the United States; and our President sends his ministers to other capitals all over the world, and consuls or business agents to every great city.

The Navy Department is in the side of the building which faces the White House. Here the Secretary of the Navy has his offices, and here many clerks are at work upon matters relating to our navy. A country like ours must have many war ships to defend it. There is always danger that some other nation may have trouble with us and may send gunboats to destroy our cities on



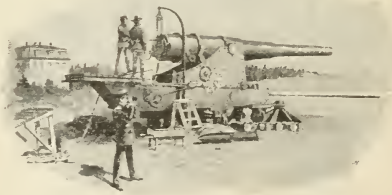
U. S. Cruiser *New York.*

the seacoast. Every great nation has a navy. We know we are in the Navy Department by the beautiful models of war vessels which we see in the halls. These models are toy ships, in all their parts exactly like our

men-of-war, only hundreds of times less in size. By looking at the models we can learn something about the real war vessels, and can see just how they work.

Here, for instance, is a model of the armored cruiser *New York*. The model is so small that you could put it in a two-bushel basket; but the ship it represents is as long as a city block, and so wide that it would fill an ordinary street. The *New York* is made almost altogether of iron and steel. Its outside is covered with steel plates several inches thick, in order that the balls fired at it from other ships in a naval battle may not go through it.

The guns of the *New York* are of many kinds. Some will send a shower of bullets at the enemy, hundreds of balls flying forth in a minute. It has cannon of several sizes, some of which are so big that it takes two bushels of powder to fire them, and so powerful that they will send shells of solid steel, weighing as much as three full-grown men, twelve miles at one shot. The war ships of other nations have similar guns, and hence you see why we must have our vessels plated with steel to fight them.



A Modern Coast-defense Rifle.

There are a number of these large gunboats in our navy. There are smaller war vessels, which will go very fast, and which are known as commerce destroyers. There are curious torpedo boats, which can travel below the surface of the water and send out bombs to explode under the war ships of the enemy and blow

them to pieces. There are also models here of some of our gunboats known as rams, from the front of each of which extends a sharp steel point. Such vessels run at full speed against the ships of the enemy, and sink them by making holes in their sides. These things show us how terrible war is, and we should be glad if our country could always be at peace with other nations.

We see more of such matters during our visit to the War Department. This has to do with the army. We must have soldiers upon land to defend us as well as ships upon the sea, and we need troops in some parts of the United States to protect us from the Indians and to keep them in order. The United States has but a small number of troops in comparison with other nations, for we learn that in times of peace only twenty-five thousand soldiers are required by our great country with its millions of people. We wonder at this, and we ask one of the generals why the army is so small.

A Soldier.

He replies that the army does not give any idea of the strength of the American people. He tells us that each state has its militia, so that within a few hours one hundred thousand more men could be put under arms; and he says that the United States, in case of a war, has so many people that it could furnish more than ten millions of fighting men on very short notice. This is far greater than any other army in the world, and as we think of it we feel very proud of our country's strength.

Passing now down Pennsylvania Avenue, we visit the

Treasury Department. The Treasury has to do with the money of the government. A vast sum is needed to pay the salaries of the employees, to carry the mails, and to do other kinds of government work.

The money comes, in part, from the tariff on imports, or taxes upon things from foreign lands which are sent into this country for sale. When ships arrive at any port they are examined by the customs officers of the Treasury Department, and upon certain kinds of goods a tariff, or tax, is collected. This tariff, or tax, is a stated

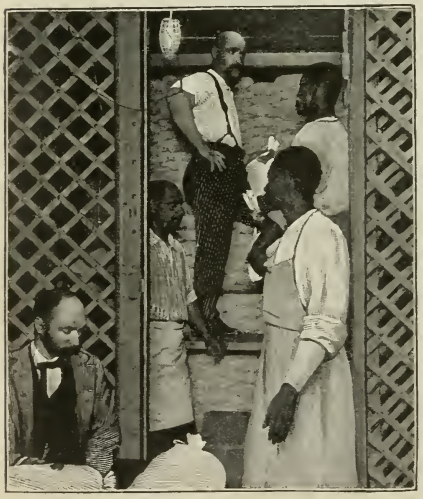
The Treasury Building.

amount for each yard, gallon, or pound of the material, or a certain per cent. of the cost of the goods in the land from which they have been brought. This amount is usually added by the importers to the price asked for the goods, so that when we buy them it is ourselves who really pay the tax.

Other taxes come from certain kinds of goods manufactured in our country. These are known as revenue taxes, and are collected only on spirituous liquors, such as whisky,

brandy, and beer, and upon manufactures of tobacco for chewing, smoking, and snuffing. Such taxes are also usually added to the cost of the articles taxed, and so the people who use them, and not the manufacturers, are really the persons who pay. In addition to this, the government gets some money from its sales of public lands, from the sale of postage stamps, and from various other sources.

The money is sent to the Treasury Department to be kept until needed. There is usually a vast amount of money on hand, and we open our eyes wide when the guide takes us down into the vaults and shows us how millions of dollars' worth of gold and silver are stored there, and guarded day and night by watchmen. In other rooms we are shown piles of crisp new bank notes, and see hundreds of clerks who are handling old and new paper money. The Treasury Department makes all of our paper money.



Interior of the Treasury Vaults.

The money factory is in that large brick building which we can see just beyond the Washington Monument. Let us visit it. We hear the rattle of the machinery as we enter the door, and the guide takes us through room after room in which, behind walls of iron latticework, scores of men and

women are busy printing bank notes. The women wear aprons over their dresses, and the men work with their shirt sleeves rolled up to their shoulders; for the printing is dirty work, and every one we see in the press room is spotted with ink. In another place are the engravers, who with fine tools are cutting out of steel beautiful pictures such as you see upon our bank notes; and in other places there are wonderful engraving machines.

How carefully everything is guarded! There are watchmen everywhere, and there are steel vaults in which all of the plates for making the bank notes are stored every night. Not one of the employees can leave the building until every note on hand has been counted and until every sheet of paper and every printing plate is known to be in its place. This is to prevent counterfeiters from getting the plates and printing money for themselves.

As we go through the Bureau of Engraving and Printing we get some idea of the wealth of our nation by seeing the bank notes required for its business. Notes representing millions of dollars are printed here in a day. We see scores of women who do nothing else but count bank notes. How fast they work! Their fingers go like lightning. They do not move their lips, but they count the bills at the rate of a hundred a minute.

After being counted, the notes are put into a great steel box on wheels and are hauled to the Treasury Department. From there they are shipped to all parts of the country. Our government never sends out a bank note a second time. It is always ready to exchange new bills for old ones, and old bills are never paid out by the Treasury Department.

But what becomes of the old bank notes?

Come with me, and I will show you. All the old money

received at the Treasury is destroyed. The bank notes are cut in halves as soon as they come in, and are then carried in a closed steel wagon to the basement of this money mill.

Let us walk down and see what is done with them. The cut notes are put into a big round iron pot, in which they are ground up by machinery and cooked and steamed until they are turned into a pulpy, gruel-like mixture which looks like mush. Sometimes as much as two million dollars' worth of money is ground up at one time. Think of a pot of mush made of two million dollars in bank notes! Wouldn't you like a good bowl of the meal before it is thrown into the kettle? There is, however, no chance to get at any of this money, for the government grinds up the notes in order to prevent any one stealing them and using them as money again.

It is in the Bureau of Engraving and Printing that all of our postage stamps are made. The process is much the same as that of printing the bank notes, and the postage stamps are as carefully watched as the money, that none may be lost. After the stamps are printed they are gummed by machinery. Then the little holes are cut around them by wheels, on somewhat the same principle as dough is cut in making animal crackers or gingerbread men.

At the Post Office Department we learn something of our vast postal system. There are maps here which show the roads over which the government sends the letters and papers that are mailed to every part of the United States and the world. Some letters must be carried on horseback or in boats, and we learn that the mail routes form a great network embracing every part of our country.

But what are those men and women doing in that office there at the side of the hall? They seem to be opening

letters not addressed to them nor to the government officers. We thought no one had the right to open a letter not intended for him. But see! the clerks here are reading the letters and putting them in new envelopes for mailing again! That is the dead-letter office. When a letter is so badly addressed that the postman cannot read the writing, or when he cannot find the person to whom it is directed, that letter is called dead.

Such letters are forwarded to the Post Office Department, where the clerks open them and, when possible, send them back to the writers. There are thousands of such letters received every day; and we learn that some people are so careless about their money that more than a million dollars is put into the mails every year in letters so badly addressed that they go to the dead-letter office. In some cases not even the signatures of the writers can be made out, and the money and letters are lost to their owners.

Just across from the Post Office Department is the great marble building of the Interior Department. This department has to do with the public lands of the United States, with education, with patents, with the pensions paid to our soldiers, and various other matters.

In the Patent Office we see models of the wonderful inventions made by Americans. The Americans are the greatest inventors in the world. It is said that more than two fifths of the most important inventions ever made have originated in our country, and more than twenty-five thousand patents for new things are taken out every year. These inventions are of all kinds. They range in size from pills as big as the head of a pin to balloons almost as large as the dome of the Capitol, and in complexity of mechanism from collar buttons to steam engines.

It is strange how much some of the little things have

paid their inventors. When a thing is patented, no one, until after a certain time, can make it without the permission of the inventor. He can charge what he pleases for the right to manufacture it; and one of the great lessons of the Patent Office is that we should not despise the little things. The patent for the rubber tip on the end of your

Interior of the Patent Office.

pencil, for instance, was worth more than one hundred thousand dollars to the man who first thought of it. The gimlet-pointed screw brought one inventor a vast sum of money, and the man who first thought of putting copper tips on the toes of children's shoes grew rich out of that idea. The inventor of the roller skate is said to have received many hundreds of thousands of dollars from his

patent. Patents for different kinds of building blocks have made their owners much money, and the man who invented the return ball with a rubber string attached to pull it back received a large income for some time from this patent.

The Interior Department has also charge of the Census Bureau. Every ten years men employed by this bureau count all the people in our country, and find out all about them, so that we here can learn just how many people there are in the United States and what they are doing.

At the Agricultural Department we are shown a room filled with glass cases containing every variety of apples, peaches, grapes, oranges, pineapples, and many other kinds of fruit. They look so delicious that we feel like eating them until we learn that they are made of wax and painted to represent fruits. There are also many kinds of nuts shown here, and we see specimens of all the things grown in our country, from the cotton and tobacco and rich fruits of the tropics to the hardiest products of the temperate zone.

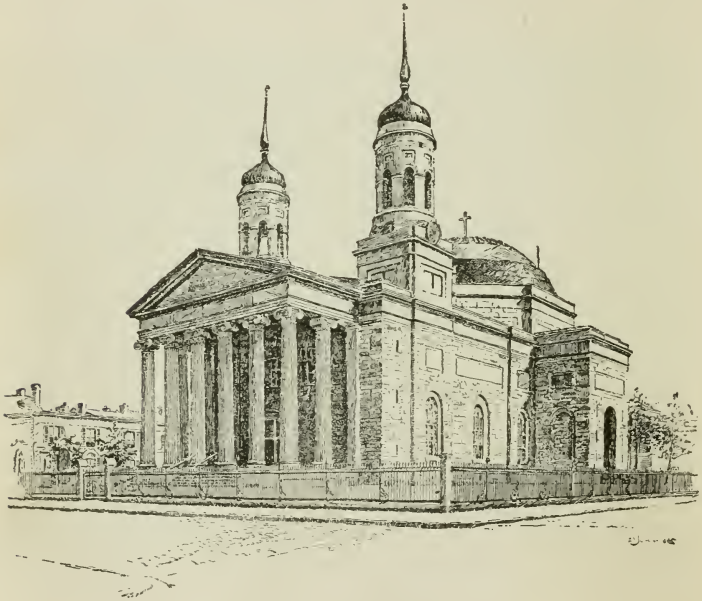
V. BALTIMORE AND OUR OYSTER BEDS.

WE leave Washington this morning, on our way to New York. It is only a six hours' ride on the cars from one city to the other, but the country through which we travel is one of the most thickly populated sections of the United States, and we shall pass quite large cities every few miles. We reach Baltimore in less than an hour.

Baltimore is a great commercial center. It is at the head of Chesapeake Bay, and we find big ocean steamers at the wharves of the city, and see grain, flour, tobacco, and other

products taken from the cars and loaded upon ships to be carried to Europe, South America, and other countries.

When Washington city was laid out Baltimore had already eight thousand people and was considered one of the chief towns of the country. It now contains more than half a million of people, and it has so many streets that if



The Cathedral at Baltimore.

they were stretched out in one long line they would reach almost from New York to Chicago. We visit the cathedral, the first built in the United States, Druid Hill Park, and the Johns Hopkins University. Then we take a look at the monument which the Baltimore people have put up in honor of Washington. It seems quite small after seeing the huge structure in the national capital.

We find ourselves quite hungry after our rapid tour through the city, and resolve to take a lunch at the station before we go on to Philadelphia.

What shall we eat?

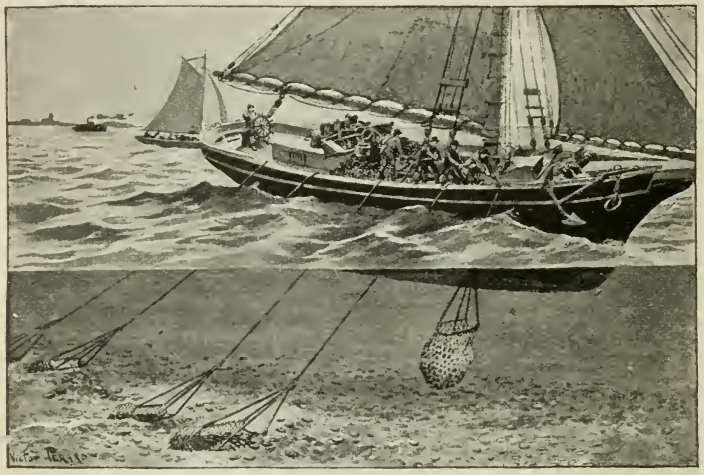
We order oysters, for Baltimore is the greatest oyster market in the United States. More than one third of all the oysters of the world are grown in the waters of Chesapeake Bay, and there are in Baltimore many thousand men and women who do nothing but take the oysters out of their shells in order that they may be shipped in tubs and cans to different parts of our country. The Americans eat more oysters than are eaten by the people of any other nation. From the number that we consume every year, a dozen might be given to every man, woman, and child on the globe, and there would be still some to spare.

The oysters shipped from Baltimore are found in the shallow waters along the coast of Chesapeake Bay. They grow also in some other salt waters of the United States, but there are more good oysters in Chesapeake Bay than anywhere else. Most of the oysters here grow of themselves; but there are also oyster farms—places in the bay or at the mouths of the rivers where the oyster eggs are put, and shells thrown into the water, to which the young oysters can fasten themselves and grow shells of their own.

Oysters grow in this way for four or five years before they are big enough to be eaten. The eggs from which they are hatched are so small that you cannot see them with the naked eye. It is said that one oyster will lay more than a million eggs in a season.

When an oyster is hatched it is as small as the point of a fine needle. It looks like a little white dot. It at once fastens itself to a piece of stone or shell or anything it can find which is hard. It soon gets to be as big as the head

of a pin, and so increases in size that when it is a year old it is as large as a silver twenty-five-cent piece. After this it grows about an inch a year for from four to six years, when it is full grown. You can tell how old an oyster is by its shell. The layers upon it show the number of years



Oyster Dredging.

it has lived. The shell grows thicker and thicker year after year. Shells have been found which were nine inches thick, and some scientists claim there are oysters which have lived one hundred years.

The oysters are gathered during the fall and winter by men who sail in big boats over the beds where the oysters lie. The oystermen have long rakes, which they push down into the water and thus drag up the oysters. Sometimes they use dredges, or great shovels worked by machinery, which scoop the oysters out of the bottom of the bay.

But here come our oysters. They are brought in on the half-shell, and we see that there are two parts to an oyster shell. One part is hollow and the other is flat. In the hollow portion lies the liquor which is the life blood of the oyster, and if it were not for this it is said the oyster would die. At the back of the shell we see the hinges by which the two parts are kept together.

What queer-looking things these oysters are as they lie before us on the shells! They have mouths, but no heads. The mouth of the oyster is in the narrowest portion of the body. It is merely a hole in the skin, for the oyster has neither tongue nor teeth. The mouth has four thin lips, and the oyster gets its food by filtering the water which it takes into its mouth through them. It has no nose and no eyes; but scientists say that oysters will close up their shells if a shadow passes over the water above them; hence they must have some way of knowing what is going on about them. The oyster has lungs and a heart. Its stomach is a little bag which lies just behind the mouth. As we think of these things we almost hesitate to let the oyster slip down our throats. We try one, however. The delicious taste takes away our scruples, and we find ourselves eating a second dozen before we are satisfied.

VI. IN PHILADELPHIA—A VISIT TO THE MINT.

A CAR ride of less than three hours brings us from Baltimore to Philadelphia. We pass the manufacturing city of Wilmington, Delaware; and long before we reach Philadelphia itself we see great factories, and learn that we are in one of our chief manufacturing centers. There is only one city in the country which has more manufacturing establishments than Philadelphia, and that is New York. There are more than two hundred and sixty thousand men and women in Philadelphia who make things to sell. Thousands are busy weaving woolen cloths and making clothing. There are thousands of men building ships, and our greatest naval vessels are made here. Other thousands are making goods of iron and steel; and we learn that the United States has become the greatest manufacturing country in the world.

William Penn.

After our country was first settled the most of the people were farmers. They raised things from the soil. As more people came, some of them began to make things to sell. This has gone on until now one man out of every five in the United States is engaged in manufacturing. We have now twelve times as many factories as we had forty years ago, and a vast amount of money is spent every year in paying the wages of the men who work in them. If we could see all the workmen of the world, we should learn that our people are better fed, and better clothed, and have better houses than those of any other nation.

We find this especially so in Philadelphia. We walk for miles through long streets of small but neat houses made of red brick with steps of white marble. There are thousands of such houses here belonging to the working people, and it is said that more people own their own homes in Philadelphia than in any other large city of the world.

But why has Philadelphia become a great manufacturing city?

One reason is because it is so situated that materials can be cheaply brought to it and the manufactured goods shipped from it to other parts of the United States. The slopes of the Appalachian range are such that railroads have been built from Philadelphia through the passes of the Alleghany Mountains, thus giving it an easy road to the lands farther west. It is also a seaport, although it is one hundred miles from the Atlantic Ocean. Large steamships can sail up Delaware Bay to Philadelphia, bringing the materials people want to use in their shops, and carrying their manufactures to all parts of the world. The Schuylkill River furnishes Philadelphia with water power for manufacturing purposes, and the city lies so near the coal lands of Pennsylvania that

Independence Hall.

the fuel for steam power costs very little. Not far from it are the largest beds of anthracite coal to be found anywhere. This coal makes a great heat and is very valuable for manufacturing. It is so hard that people for a long time did not think it would burn, one noted man saying that if the world were burned up this would be the very last thing that would catch fire.

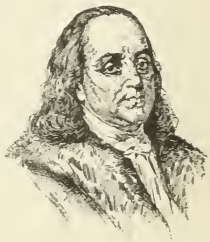
Philadelphia is one of the oldest cities in this country; it was founded by the Quakers under William Penn; and for ten years, from 1790 to 1800, it was the capital of the United States.

City Hall, Philadelphia.

We visit Independence Hall, where the Declaration of Independence was signed. Then we walk through the city hall, one of the largest and most beautiful buildings in

the United States. Upon its tower there is a bronze statue of Penn which was made by Philadelphia workmen, and is one of the largest statues in the world. It does not seem very big as we look at it from the ground, but it is really as tall as a three-story house, and the buttons on the coat are half a foot across.

During our tour through the city we stop for a moment at the grave of Benjamin Franklin. It is in the little graveyard of Christ Church, in the midst of the hum and hurry of the busy city, and is marked by a plain marble slab. It was in Philadelphia that Benjamin Franklin lived the greater part of his life. He was born in Boston, and learned there the trade of a printer. He came to Philadelphia as a boy to find work, and his first meal in the city was made of a loaf of bread which he bought and ate as he walked through the streets. He afterwards became a great man and was of much service to the United States.



Benjamin Franklin.

When Franklin first came here, Philadelphia was larger than New York. It was the biggest city in the United States until the Erie Canal was built. This made New York grow so fast that she soon got ahead of Philadelphia, and Philadelphia is now smaller than either New York or Chicago. It has, however, more than a million people, and it has many beautiful buildings.

We visit the mint, where most of our gold, silver, and copper money is made. There are several other mints in the United States, but the Philadelphia mint is the oldest. It was founded during the presidency of George Washington, and it coins millions of dollars' worth of gold and silver every year. It is situated in the heart of Philadelphia,

not far from the city hall. There are guards at the door, and visitors are carefully watched as they are taken from room to room and shown the processes of coining money.

During our tour the superintendent of the mint goes with us. He takes us down into the vaults and shows us where the gold and silver metal and coin are stored away.

Interior of Money Vaults, Philadelphia Mint.

In one vault we see millions of silver dollars tied up in bags, and stacked up against the wall like so much corn. In a smaller vault we are shown piles of gold bricks. They are laid up in regular order in different parts of the vault. They are, as a rule, about the size of a cake of kitchen soap, and they do not look very heavy.

The superintendent asks us to lift one of them, and we

find our backs almost broken by the effort to raise it. Each brick weighs forty pounds, or as much as a six-year-old boy. In other vaults we are shown quantities of silver bullion, the bricks of which are larger and heavier than those of the gold vaults, and we learn that from these gold and silver bricks our money is made.

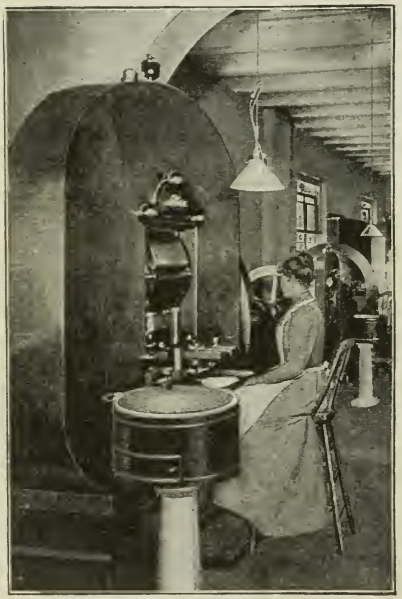
In going through the mint we are taken into a room where they are melting the gold, and the superintendent shows us how copper and other metals are put with it into the melting pot, in order that the money may be harder and wear better. The gold we saw in the bricks was so soft that we could scratch it with our finger nails. It was pure gold, and the superintendent tells us that coins made of pure gold would soon wear away, and that a pure gold wedding ring would hardly outlast the honeymoon.

The gold bricks, having been melted, are cast into ingots. Ingots are long gold wedges. They are about as wide as a twenty-dollar gold piece, and are a little more than a foot long and two inches thick. It is from them that the gold coins are made.

As we go on into the silver-melting room we see that the silver for the silver dollars is also cast into strips of the same kind. We see a man wheeling a box of these silver ingots out of the room, and follow him along the hall to see the ingots made into dollars. We still have the idea that our coins are made by casting, the gold and silver being melted and turned into molds just as in the making of bullets, save that, when the molds are opened, out drop gold dollars and silver dollars instead of balls of lead.

We soon find, however, that our coins are not made in that way. They are stamped out of cold metal, and machines with an enormous pressure put upon their faces the beautiful images of the goddess of liberty and the Ameri-

can eagle. The silver ingots are first rolled between cylinders of steel so graduated that the ingots grow thinner and thinner as they are pulled through them, until they are at last just a little wider and about as thick as a silver dollar. They have been so stretched out by the process that they are like long bands of hoop iron rather than like chisels or wedges. These bands or strips are now run under a vertical steel punch which cuts out of them round pieces of silver of just the size of a dollar. These are the blanks of which the dollars are to be made.



A Coining Machine.

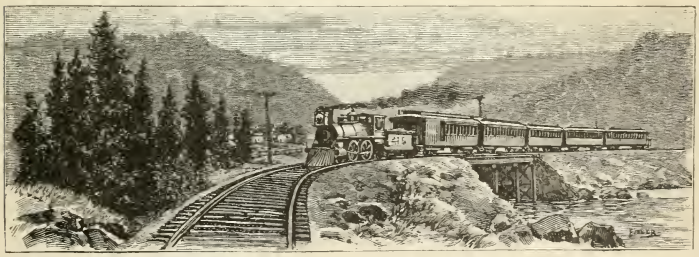
It is very important that each coin should have the right amount of silver in it, so each blank is weighed before it is stamped. After weighing it is taken down into the basement of the mint, and, with thousands of other blanks, is shoveled into a vat of acid, which soon eats the dirt off of it. It is then dried and taken upstairs to be coined.

The coining is done by what is known as the coining machine. The silver blanks are fed through a long tube into a machine which drops them between two dies. The upper die bears the picture of the goddess of liberty,

and the lower that of the American eagle and the lettering which you find on the silver dollar. As the coin lies there the two dies come together, exerting an enormous pressure, and stamping the beautiful impressions which you see on our silver coins.

Gold coins are made in the same way, and pennies are manufactured by the thousands in much the same manner.

Leaving the mint, we take a run out to Fairmount Park, where the Centennial Exhibition was held, to have a look at the Zoölogical Garden. We visit Girard College, which was founded by a rich man for the education of poor boys; and then, after a meal at the magnificent railroad station at Broad Street, we take the train for New York.



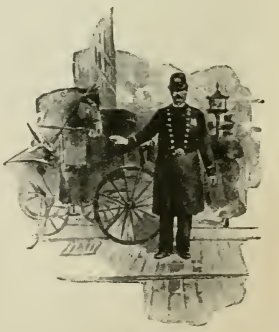
VII. NEW YORK AND SOME OF ITS WONDERS.

IN coming from Philadelphia to New York, the railroad train brings us only to the banks of the Hudson River at Jersey City. Here we step from the cars into a ferry boat, so big that it could not be squeezed into the average city street. It has enormous steam engines upon

it, which push it through the water, and there are dozens of carts and wagons, and hundreds of men, women, and children with us as ferry passengers. We are soon across the river; the bell rings as we come to the wharf, and we are landed on the island of Manhattan, in the busiest part of New York.

A Ferryboat.

We are now in the biggest city of our hemisphere. New York contains more than three millions of people, and it is, with the exception of London, the largest city on the globe. It is hard for us to realize how big New York is. It grows upon us at every step as we travel through it. We ask for a hotel, and hardly know which one to choose when we find that there are so many in New York that we could lodge in a different place every night for more than three years without going out of the city.



A New York Policeman.

The business sections are so crowded with street cars, wagons, and carts that we have to ask a policeman to help us from one side of the street to the other. We see policemen at nearly every street corner. They are dressed in blue uniforms, and have silver badges on the breasts of their coats. With a motion of their hands to the drivers they hold back the wagons for us, and we learn that it takes thousands of such men to keep order

here. At first we determine to see the whole city, but find that it has so many streets that it would take weeks for us to walk through them, and we give up the plan in despair.

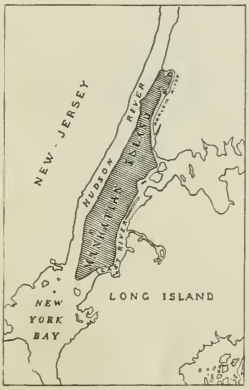
But before we go on, let us stop a moment and think just where New York is; for it is its situation that has made it so great. The main portion of the city is on the island of Manhattan, at the mouth of the Hudson River. But it also includes a portion of the mainland north of Manhattan, the boroughs of Queens and Brooklyn on Long Island, and the whole of Staten Island. New York Bay, which is partly inclosed by the city, is one of the best and largest harbors in the world.

The easiest and cheapest route from the sea to the interior of the United States begins at New York. This route is by the Mohawk Valley, through which the Mohawk River flows into the Hudson. Some of our greatest railroads are built through this low valley. The slope of the route over the Appalachian highlands is so slight that freight has to be lifted much less upon it than upon the routes across the mountains farther south. It is for this reason that goods can be sent more cheaply from the East and from Europe to the interior of our country by way of New York than by any other route. New York is also connected with the Great Lakes by the Hudson River and the Erie Canal, so that the vast farming regions of the United States lying about and beyond these lakes can send their crops by water to New York to be shipped to Europe.

The island of Manhattan is less than fourteen miles long, and so narrow that you could walk from one side of it to the other at almost any point in less than an hour. Its form makes you think of a poorly laid-out baseball ground. It is in the shape of an irregular diamond, squeezed in

between two rivers, its lowermost point extending out into New York Bay.

It is at the lower part of this island that we land. The ground here is so valuable that you would have to cover it with gold dollars to buy it. This island is now one of the most valuable pieces of property in the world, and it is safe to say that the gold mines of the whole world could not in one year produce money enough to purchase it.



Manhattan Island.

What do you think the Indians got for it?

They sold it for twenty-four dollars. They did not think it worth much, for it was hard to get at with their little canoes. So when some men from Holland came to America, not quite three hundred years ago, and built a fort here, they found the Indians not unwilling to sell. The savages did not then know what money meant, and they took their pay in a lot of beads, buttons, and other small trinkets.

The Dutchmen from Holland built a little town upon the island and called it New Amsterdam. It kept that name until the place was taken by the English, when it was named New York. It was already the second city of the United States at the time the Declaration of Independence was signed. After the Erie Canal was opened, however, New York grew so rapidly that it soon became bigger than any other of our cities, and it has been the chief American city from then until now. It will probably, in the course of a few years, be the largest city on the globe.

We spend some time on Broadway. This is the main business street of New York. It is one of the liveliest and noisiest streets in the world. What a crush and jam there is everywhere! Every one is on the rush, and we are jostled and pushed this way and that as we join the hurrying crowd. The sidewalks are fairly black with men, women, and children, who are moving along, paying no attention to any one but themselves. The roadway is blocked with moving cars and wagons, the drivers of which are scolding at one another.

A Scene on Broadway.

How very high the buildings are! They are so tall that you could not shoot an arrow up to their roofs. Some are from twelve to twenty and even twenty-five stories high, and in some single buildings in New York there are more men doing business than there are people in a large country village.

These big office buildings are furnished like palaces. You walk through them upon floors of marble. Numerous elevators are moving up and down from one story to an-

other, carrying the hundreds of people. Some of the buildings have post offices in them. They have boot-blacks' rooms and barber shops, and many have restaurants in the topmost story, higher than the spire of the tallest church steeple.

Everything is business here. Upon all sides of us there are great wholesale establishments. There are stores everywhere. There are even stores in the basements; and as we go through the side streets we find that thousands of people of New York work in cellars, making all kinds of goods underground.

Trinity Church.

We walk up Broadway past the City Hall Square, about which some of the big newspaper buildings stand, and then turn and go back a few blocks down the street until we come to Trinity Church, one of the oldest and most beautiful buildings in the United States. It is made of brownstone, and there is a large churchyard about it, in which are the tombstones of some of the most famous Americans of the past. The churchyard is a beautiful place filled with flowers and trees, and it seems strangely peaceful in contrast with the pushing throng on Broadway.

We enter, and stand for a moment by the tomb of

Robert Fulton. He was the man who made the *Clermont*, the first steamboat that sailed on the Hudson River. The *Clermont* made its first trip from New York to Albany in 1807. Its voyage proved that the steamship could be made a commercial success, and Robert Fulton may be called the father of the thousands of steamships which now come to New York every year.

Wall Street.

Near him in the old churchyard lies Capt. James Lawrence, the hero of the frigate *Chesapeake*, whose famous "Don't give up the Ship" immortalized his memory; and at the lower end of the yard we see the white marble monument under which lie the remains of Alexander Hamilton, one of the founders of our government, who was shot by Aaron Burr in a duel.

Leaving the churchyard, we cross Broadway and take a walk down one of the most wonderful streets in the world. We are in Wall Street, and all about us are the buildings which contain the offices of the men who own and control much of the wealth of the United States.

Wall Street may be called the money capital of our

country. The greatest of our railroads are managed from here. Here is the Stock Exchange, where all kinds of stocks are bought and sold. By stocks, you know, are meant shares in different business companies, such as railroads, steamships, telegraphs, and telephones. The prices of stocks sometimes change very quickly for a variety of reasons, and men make and lose fortunes in buying and selling them. It is in the Stock Exchange that such business is done.

We are admitted to the gallery of the building, and we look down upon one of the most curious sights in the world. In the big room below us there are hundreds of well-dressed men, some with hats on, and some with none, running to and fro, pulling and yelling at one another. They are the bankers and brokers who are the members of the exchange. It costs each of them twenty thousand dollars for the privilege of buying and selling here. Each has a little notebook in one hand and a pencil in the other, and with these he jots down his purchases and sales. Telegraph boys rush in and out through the crowd, and the sight makes us think of a lot of madmen rather than a body of sensible people. An enormous business is done, and billions of dollars change hands on that floor every year.

Near by we find the Produce Exchange, where grain of all kinds is bought and sold. New York is one of the chief grain markets of the world, and in this exchange wheat, corn, and oats are not sold by the bushel, but by the thousands of bushels. The smallest amount you can buy or sell is five thousand bushels, and so much changes hands that millions of bushels are often bought in one day. We next visit the Cotton Exchange, where men buy and sell cotton in large quantities; and our heads fairly swim as

we try to understand the vast sums which it takes to manage the business of this one city of our country.

We are, in fact, anxious to get out of the bustle, and we walk down a side street to rest our eyes and ears before taking the Broadway cable cars to make our way farther uptown to the hotel where we shall stop overnight.

VIII. OUR FOREIGN COMMERCE.

THE largest hotels of New York are in the middle of the island of Manhattan, several miles above the point where we first reached Broadway. The one in which we stay overnight is not far from Madison Square, and when we start out in the morning we are in the heart of one of the great shopping districts. Broadway is here almost as busy as it is down at Trinity Church, and the side streets leading to it are so lined with store windows that passing through them is like going through a huge museum walled with glass cases.

Hotel Waldorf-Astoria, New York.

Goods of all kinds

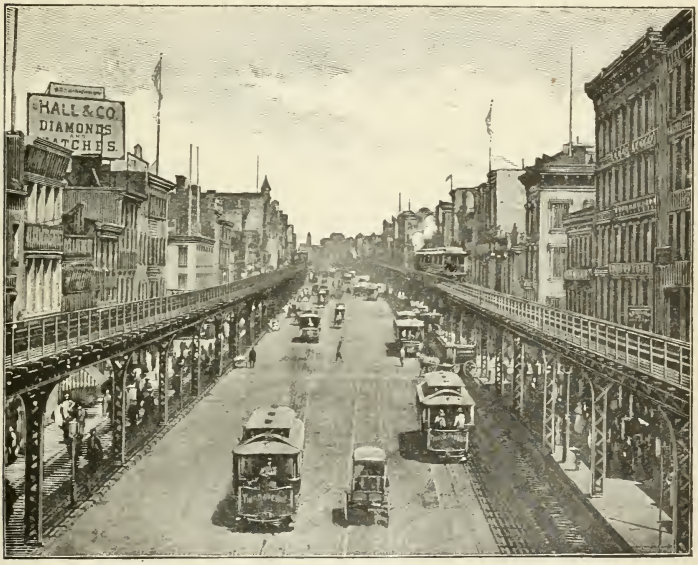
are here spread out before us, and we see that every nation of the world has sent its products to New York for sale. Those bright-colored silks over there came from China. They were woven on rude looms by yellow-skinned, slant-eyed men and women upon the banks of the Yangtze Kiang. They were brought to America on a steamship through the Indian Ocean, by way of the Red Sea and the Suez Canal. They crossed the Mediterranean, passed through the Strait of Gibraltar, and thence to New York. Those rich velvets and laces were carried over the Atlantic Ocean from Europe; and those large diamonds which you see in that jewelry store were dug by black-skinned, half-naked men in the mines of South Africa.

There is a tea store which is supplied by the bushes which grow on the Himalaya Mountains in northern India and by the tea gardens of Japan and China. Next to it is a shop where you can buy coffee from Brazil and sugar from Cuba. That toy store has many French dolls, and curious mechanical playthings which were made in the mountains of Germany; and that tiger-skin rug which you see in the window next door once covered the body of a beast that prowled through the jungles of northern Hindustan. There are other things all about us from every part of the world, and we resolve to go to the wharves and see the great ships which bring these things into our country.

We walk down Twenty-third Street, and take a ride through the air to the lower part of the island. The city, though narrow, is so long, and the streets are so crowded, that it takes the horse cars and cable cars a long time to go from one end of it to the other. In order to make the journey more quickly elevated roads have been built over some of the avenues. Upon these roads trains of cars are drawn by locomotives almost as rapidly as on an ordinary

railway. The railroad tracks are supported by iron columns which extend to the height of the second- or third-story windows.

We have to walk upstairs to get to the cars, and we find ticket offices and news stands on the elevated platforms. Our tickets cost us five cents apiece. We drop them in



Elevated Railroad on the Bowery, New York.

the box at the door of the station, and rush for the cars. As we step aboard, the guard closes the iron gates at the side of the car platform, and the train begins to move.

The cars have windows like those of a street car, and we can see into the upper stories of the houses as we fly along the street. Here women are washing clothes, there they are cooking; here we go by a shop where tail-

ors are working, and there we pass buildings given up to manufacturing.

New York has more factories than any other city in the country. It has hundreds of thousands of people who do nothing but make things to sell; and if every man, woman, and child in the United States would throw six dollars into a pile they would not, all together, give enough to buy the goods which New York makes in one year.

Wharves, East Shore of Manhattan.

But here we are at the wharves. What a crush and jam there is all about us! We ask policemen to help us across the streets through the crowds of wagons, carts, and trucks loaded with goods on their way to the boats. We walk for miles past great docks, upon each of which

there are enormous long sheds filled with bales, boxes, and barrels, and in which scores of men are at work loading and unloading vessels.

New York has more than twenty-five miles of water front on Manhattan Island alone, and there are also long lines of wharves and landing places on the Long Island shores. More than half of all that is bought of foreign nations by the United States comes here.

Our imports consist, with the exception of a few things that cannot well be raised in America, almost altogether of manufactured articles. We are the greatest manufacturing nation of the world, but our factories are not yet numerous enough to supply all our needs, and so we import much from other countries. The amount of money we spend for goods bought in this way is so great that if it were divided among all of our people, every man, woman, and child of us would get ten dollars' worth every year, and there would be some to spare.

Nearly half of all that we sell to other countries is carried out on ships which sail from New York, and we here get some idea of our foreign commerce.

More than three thousand steamships come from foreign countries to these wharves every year. There are thousands of sailing vessels, and a procession of steamers is always moving back and forth across the Atlantic Ocean, carrying our goods to the people of Europe and bringing their goods to us.

The most that we sell comes from our farms. We raise more farm products than we can use, and the United States is to a large extent a big country store for the European nations. Every year two thousand ships laden with grain sail out of New York. The steamers have their holds filled with grain in bulk, and between the decks

the wheat is piled up in bags. Such vessels are loaded very quickly, and almost half a million bushels of grain can be packed away in a ship in an hour. Vast amounts of meat and other provisions are sent across the Atlantic every week, and millions of dollars' worth of cattle are carried away to be killed in Europe for the people there.

The people of both Europe and Asia send to this big country store for a large part of the oil which they use in their lamps. Our petroleum is carried over all the oceans. It is shipped from New York, Baltimore, Philadelphia, and other places, in what are known as tank steamers, a single one of which will hold as much as thirty thousand barrels of coal oil. These steamers are divided into a half-dozen or more huge tanks. The oil is pumped into the tanks, and it remains there in bulk until it is again pumped out upon the wharves of the great ports of Europe, Asia, and Africa.

It is in vessels of the same kind that molasses is brought to the United States from Cuba. Think of the biggest house you have ever seen as one solid box, and let it be filled with molasses, and you may get some idea of the sweetness which, protected only by a thin sheet of steel, is thus carried through the salt waters of the ocean.

We visit ships at the wharves which are loaded with cotton. This comes from the cotton fields of our southern states, and is carried in bundles or bales to Europe and Asia to be made into cloth. We sell more than twice as much raw cotton every year to other countries as we do wheat and flour. Cotton is, in fact, the most valuable of all the articles which the rest of the world buys in our store. We sell about two thirds of all the cotton we raise, and we sometimes get as much as two hundred million dollars for it from Europe in a year. We learn that we sell more

goods abroad than we buy, and that in some years the other nations of the world pay us many million dollars more than we pay them.

Our chief trade is with Europe. The English are our best customers. We sell them large quantities of raw cotton, breadstuffs, and meats, for which we get several times as much as we pay for the manufactured articles which they sell to us.

The fastest steamers in the world are those which go between Europe and America. Some steamships cross the

An Ocean Greyhound — *Kaiser Wilhelm der Grosse.*

Atlantic in less than six days, and they go so swiftly that they have been called the ocean greyhounds. We visit one of these steamers, which has just arrived at the wharf, and find parts of it fitted up like a parlor. It has large

dining rooms, sitting rooms, bedrooms, and bathrooms, and we see that people can live quite as well now upon the water as upon the land. We look at the enormous engines, as strong as twenty thousand horses, which drive the huge ship through the water, and we are surprised when told that its furnaces use up every day as much coal as would heat thirty large dwelling houses for a whole year.

Away down in the lower part of the ship we find what is known as the steerage. This part is not so well furnished. It is full of poor people who have come from Europe across the Atlantic to our country. Such people do not land at this wharf. They are carried to the landing place of the Department of Immigration near the lower end of Manhattan Island, where officers of the government examine them to see if they are likely to become good citizens of the United States. We are glad to have persons from all parts of the world come here to live and help develop our lands, but we do not wish to bring in among us those who are unable or too lazy to work, and who are likely to go into our poorhouses to live. So the government has provided that all poor people coming into New York must be examined before they can land. If they have no money whatever, and seem to be worthless, they are sent back to Europe; but otherwise they are permitted to stay.

For years the poor people from all parts of Europe have been coming to America, because they can make more money and live better here than at home. Since 1820 it is estimated that more than fifteen millions of such people have arrived on our shores, and in 1890 almost one half of our inhabitants were either born in other countries or were the children of people born there.

We visit the place where these immigrants land. Here we find ourselves surrounded by hundreds of odd-looking

men, women, and children. Very few of the women wear bonnets, and many of the men have caps or queerly shaped hats. There are many English and Irish, and a large number of Germans. There are dark-faced Italians, and long-bearded Jews from Russia and Poland. There are people from Norway and Sweden, and we see boys from Holland, who wear wooden shoes. Every person has his baggage with him, and some sit on piles of bedding which they have brought from their homes. They seem strangely out of place; but as we look at them we realize that they are strong and able to work, and that the most of them in a short time will be good American citizens.

Liberty Enlightening the World.

We take a boat and sail over to Bedloes Island, in the harbor, to see the magnificent statue of Liberty Enlightening the World. This statue is intended to show every one who comes into New York that this is a free country where the people rule themselves and where all the world can learn to be free. The statue is as high as a very tall church steeple. We get some idea of its size when we learn that forty men have stood inside its head at one time, and that its forefinger is so long that it would reach from the floor to the ceiling of an average room, and so big around that the hoop of a flour barrel would just about fit it if used as a ring.

As we leave the statue and go back to New York we have a fine view of the Brooklyn Bridge, which unites that part of New York known as Brooklyn with Manhattan

Island. This is one of the most wonderful bridges ever made. It is an immense structure of stone and steel, more than a mile in length, crossing the water way called East River. The bridge cost more than the Capitol at Washington, and one of the most interesting things about it is the story of how it was built. It was designed by

The Brooklyn Bridge.

John A. Roebling, who died before it was begun. His son took up the work, and after thirteen years it was completed. The young man worked so hard in superintending the building of the bridge that he broke down in health, and the doctors refused to permit him to go out of the house. This was after he had worked only three years. Still he superintended the work to the end.

He took a house on Columbia Heights, not far from the bridge, and with windows looking out upon it. Here from his sick room with a telescope he watched the builders day by day and hour by hour for ten years as they built the bridge, sending his orders as to just how everything should be done, and superintending the work almost as well as though he had been on the spot.

A View in Central Park.

We close our day by a visit to Central Park, the great playground for the boys and girls of Manhattan Island. It is full of interesting and beautiful things, and is one of the finest and most famous parks in the world. Prospect Park, on the Brooklyn side of East River, is another delightful pleasure ground, but we cannot visit it now. After another restful night at our hotel, we take the elevated road for the Grand Central Railroad Station, where we board a train for New England.

IX. NEW ENGLAND—COMMERCE AND MANUFACTURES.

NEW ENGLAND is made up of six of the smallest states of the Union. The New England states, Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, and Connecticut, taken together, are smaller than either Kansas, Minnesota, or Nebraska. They are not half as big as California, and but little more than one quarter the size of Texas. It would take nearly thirty Connecticuts to cover Montana, and two hundred Rhode Islands to be as big as Texas.

The soil of New England is such that its people can make more money in other ways than by farming. A large part of the land is mountainous. The Appalachian mountain chain runs through it, and the only very fertile spots are to be found in the valleys of the rivers and in the narrow strip of Atlantic plain which runs around the coast. A large part of Maine is covered with forests and lakes, and much of the land in other New England states is so stony that it can be used only for the raising of cattle and sheep. More than half the food consumed in this part of our country comes from the Mississippi Valley. The New England winters are long and cold, and the ground is often covered with snow for months at a time.

You would think that this would be one of the poorest parts of the United States, that few people could live there, and that those who manage to exist would have very little money indeed.

Now the truth is, New England has vast wealth and a great population. The southern portion of it is the most

thickly settled part of our country. There is no other state which has so many people in proportion to its size as Rhode Island. Connecticut and Massachusetts have hundreds of cities and villages. There are few places in the world where the people live so well. The people of New England have, in fact, more money than those of any other section of the same size in the United States; and Massachusetts has enough wealth to buy some of the Western states that are ten times larger.

How does this come to pass? New England has no great gold, silver, or iron mines, and it has no large coal fields like those of Pennsylvania.

The secret of it is in manufactures and commerce. The steep mountains which seem so poor to us are one of the great sources of the riches of New England. The mountains lie near the sea. They have many small rivers and streams flowing rapidly down them, which give great water power just at the places where ships can most cheaply bring the materials for manufacturing, and from where the goods made can be easily sent to all parts of the world. This has led men to build factories along all these streams. Water power is the cheapest of all kinds of power. A little stream will often do the work of a hundred horses. A great part of our manufacturing is done by water power. Indeed, it is estimated that we have so much power of this kind in our country that if we used the whole of it, it would be stronger than two hundred million horses all pulling at once.

The people of New England learned very early that it was hard to get a living from the soil. They began to manufacture for others, and soon found they could earn more money in that way than by farming. They became very skillful, so that they could make goods cheaply and

well. As our country grew they built more and more factories. They found that they could bring in coal at slight cost from Pennsylvania, and there are now factories in most parts of New England which are run by steam, in addition to those run by water.

It is wonderful how many things are made in New England. Nearly every one of us has something upon us which came from there. More than half of all the cotton

Interior of a Cotton Factory.

goods in the United States is woven in New England factories. There are vast mills which make ginghams, muslins, and calicoes out of the woolly fiber of the cotton plant from our southern states.

The enormous water power of the Merrimac and other rivers has built up great cities, such as Nashua and Manchester in New Hampshire; Lowell, Lawrence, and Fall River in Massachusetts; and Pawtucket and Providence in

Rhode Island. These cities are largely devoted to making cottons. Lowell makes more cotton cloth than any other place in the United States. It makes, indeed, so much every year that if it could be woven in one strip a yard wide, the strip would reach from Boston to San Francisco. There are also many cotton factories in the South, and we are told that factories are now being built close to the plantations upon which the cotton is grown.

A large part of the woolen goods of the United States is made in New England. The first woolen mill in America was started in Hartford, Connecticut, in 1788; and when President George Washington was inaugurated, in 1789, he wore a suit of clothes made of cloth woven in this mill.

So many of our boots and shoes are made in Massachusetts that fully one half of the people of the United States may be said to have a part of Massachusetts under their feet. Connecticut not only tells us when to get up in the morning, for it makes the most of our clocks, but it also helps us to dress, for its factories produce tons of buttons, millions upon millions of hooks and eyes, and the most of the pins which fasten our clothes.

In Massachusetts are some of the biggest paper mills in this country. There are large factories in Rhode Island which make beautiful jewelry, and in Connecticut there are many places where knives, nails, and all kinds of hardware are manufactured.

It is in this region that we can learn all about watches. In southern New England we find hundreds of men and women working on timepieces. The simplest of watches have only fifty-four parts; the more expensive ones have several times this number; and we can learn a lesson in being exact by noticing the care with which every part has

to be made. In the finer watches there are steel screws so small that they look like grains of sand. It would take three hundred thousand of them to weigh a pound.

As we go through the factories we see that, after all, steam and water do only a small part of the work of manufacturing. It takes a great many men and women to run the machines and to do certain kinds of work. Some parts of a watch are so small that it costs more than ten thousand dollars in wages to turn a pound of steel into them. We are shown hair springs which cost so much to make that it is said that seventy-five cents' worth of iron ore, after being turned into such springs, is worth four hundred thousand dollars. Of this less than one dollar would be for the ore, and the most of the remainder would be paid to the men who do the work. By this you can see how manufacturing supports a vast population.

Another great source of New England's wealth is its commerce. If you will look at the coast of Maine you will see that its shores run in and out almost like the teeth of a saw. It is called the "State of One Hundred Harbors." There are many fine harbors in Massachusetts, and there are good landing places for ships all along the south coast of New England almost to New York.

What do you think would be the business of a people with such a coast?

There would be much shipping and many sailors. The boys, hearing the sea captains tell their adventures, would want to go to sea and become captains too. Well, this is just what has happened. There are more than twelve thousand men from Maine who are sailors. During my travels in Asia I found a Massachusetts sea captain commanding a steamer on a Chinese river, and there are New England sailing vessels everywhere. This part of our

country has now a large foreign commerce. Boston has ships from all parts of the world in its harbors, and a great quantity of the American goods which are shipped to Europe and other countries is first sent to Boston.

View of Boston Harbor.

New England is now covered with railroads. On the Fitchburg road, which crosses the Hoosac Mountains, there is a tunnel more than four miles long. This is one of the longest tunnels in the world. It aids in bringing Boston into direct communication with Chicago and the Mississippi Valley, and causes much of our wheat and other products to be brought to Boston to be sent across the Atlantic. There are parts of New England where the railroads are more numerous than in any other portion of our country. They cover its lower states like a net, and in traveling over them we pass an almost endless procession

of freight trains carrying their loads to or from the many harbors along the coast.

Have you ever thought what a large part commerce has in our daily life? It has to do with every meal that we eat. At our hotel in New York we sat down to dinner before a mahogany table made from trees grown in the West Indies. Our tablecloth was woven from Irish flax, and our knives and forks were of steel made of iron which was dragged from the mines of Lake Superior, hundreds of miles to the westward. We drank coffee which had been imported from the East Indies or Arabia. The sugar we put into it came from the cane fields of Cuba or Louisiana. We had a splendid cut of roast beef which six months ago was part of an animal galloping madly over some western prairie with a cowboy behind him. We sprinkled it with salt from the salt wells of Michigan, and seasoned it with pepper which grew on the island of Singapore, on the other side of the world. Our bread was made of wheat which was ground into flour at Minneapolis and came down the Great Lakes to be used in New York. The mince pie which was brought in for dessert was filled with currants from Greece, while the three-cornered cream nuts with which we finished our meal were shaken from trees in the forests of Brazil.

We thus see how commerce and manufactures everywhere go hand in hand. The factories of New England use a vast deal of stuff which is brought here by ships from Asia, Europe, and South America, and we can find things from other parts of the world in almost every factory.

Let us visit one of the shoemaking establishments of Lynn, Massachusetts. Some of the leather was imported from Russia; some of it came in the shape of hides from

the cattle of the South American pampas, and some from those on the plains of Texas. We see skins here which have just arrived from France, Germany, or England, and some which were shipped from India, China, or the peninsula of Korea.

It is in turning the skins into leather that manufacture first joins hands with commerce. The skins, when they

Interior of a Shoe Shop, Lynn.

land in New England, are much as they were when they came from the backs of the animals. They have to be tanned before they can be used. They are soaked for a long time in vats of water filled with tan bark brought from one of the forest regions of our country; next they

are scoured and dried, then greased in order to make them soft, and then covered with blacking,—so that a single skin has to be handled hundreds of times before it is ready to be made into shoes. The nails, buttons, and strings used in shoemaking are made in different factories and from materials which come from different localities.

By machinery and by working together men can make things more quickly and at a much less cost than when one man did all the work with his hands. In the shoe shops of our forefathers one man made the whole shoe, and he probably thought he was doing well if he could make a shoe in a day. There are machines in the shops of Lynn that will sew six hundred pairs of shoes in a day, and some that will put pegs into the soles at the rate of nine hundred pegs a minute. We find that each part of the shoe is made by a different machine, and that one man works day after day making certain parts only. All kinds of manufacturing are done in this way. It takes many, many men to make a piece of cloth; and if we should go to Springfield, Massachusetts, where there is a large rifle factory, we might see guns being made which have hundreds of different parts, each of which is made by a different man.

X. AMONG THE MOUNTAINS AND LAKES OF NEW ENGLAND.

WE shall spend a part of to-day among the mountains of New England. The Appalachian mountain range, which begins in the northern part of Alabama and forms the eastern rim of the great Mississippi and St.

Lawrence basins, runs northward through New England and on into Canada. This mountain chain is made up of many ranges, some of which are parallel with one another. With its valleys, it occupies a space almost one hundred miles wide. The highest portions of it are found in North Carolina, but its most picturesque regions are in New

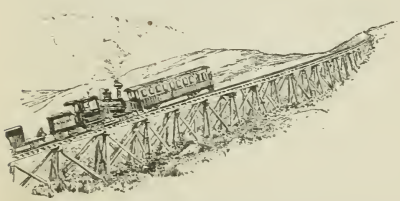
The White Mountains.

England. The White Mountains of New Hampshire are so beautiful that that state has been called the Switzerland of America by travelers who have seen the Alps.

The highest of the White Mountains is Mount Washington. We can go in an ordinary train to the foot of this mountain, and from there can ride to its summit over one of the oddest little railroads in the world. The mountain

is more than a mile high, and this little railroad goes right up to its top. In some places the track is so steep that it looks more like a ladder than a railroad, and the cars which go up it are at times at such an angle that you would think they would slide to the bottom.

This is prevented by the way the railroad is built. It has three rails instead of two, and the rail in the center consists of two bars of iron, with connecting crosspieces placed four inches apart throughout its whole length. The little locomotive has wheels which rest on the outer rails, and also a wheel with cogs which fit into this central rail, the cogs moving upon the crosspieces. The wheel is kept from running backward by a wrought-iron catch, so that if any part of the machinery gives way the steam engine can be immediately stopped. The little car in which we ride is in front of the engine, and the engine pushes rather than pulls us upward into the clouds.



Railroad up Mount Washington.

Upon fine days, such as the one we have for our journey, the car windows are open, so that we can see almost as well as though we sat in a carriage. We sit with our backs to the summit, looking down the mountain; and as we rise we can see masses of vapor nestling in the sides of the hills below us. Nearer the top we pass through clouds of mist, and are told that there are many times when the summit of Mount Washington is hidden in clouds.

At last the sun clears the sky, and we enjoy the magnificent views to be had all about us. We can see the

other mountains of the Presidential Range. There are Mount Adams, Mount Jefferson, and Mount Madison, all of which are more than a mile high; and near them are lesser mountains, named after Presidents Monroe and Jackson. From the summit we can see into Canada, and away off in the distance lies Mount Katahdin in Maine.

There is a large hotel on the summit of Mount Washington, and we may travel through the Green Mountains in Vermont, the Catskills and the Adirondacks in New York, and about through the beautiful hills and lakes of Maine, and find good places at which to stop in each region. These mountains during the summer are filled with people from the lowlands, who come here to get away from the heat and enjoy the pure air and beautiful scenery. Maine has vast forests of pine and other trees, in which there are still deer and bears, and there is good shooting in many parts of New Hampshire and Vermont.

Trout Fishing.

We can have good fishing almost anywhere in the northern parts of New England. There are trout streams in the mountains, and Maine has hundreds of lakes in which there are salmon and other fine fish. New England, in fact, supplies a large amount of the fish of the United States, though the most of the fish which are exported are caught in salt water.

All along the coast there are thousands of men and boys who do nothing else but catch fish for a livelihood. Some

have fishing vessels, in which they go far away from home to what are known as the banks of Newfoundland. They catch millions of dollars' worth of fish every year, and bring them to the United States for sale.

In our travels through the mountains we shall see what wealth New England has in its hills. We know that the streams which flow rapidly down them supply the water power which moves many of the factories in the lowlands. The mountains also furnish other things of great value, although they have no great beds of coal and iron, such as are found in the Appalachian chain farther south.

A Granite Quarry.

The stone of New England is worth a great deal of money. We find vast quarries in which granite, one of the hardest stones, is being blasted out with dynamite and cut into blocks, to be shipped to all parts of our country. Many of our cities are paved with granite blocks which have come from New England, and some of our buildings are made of granite. Beautiful marble is found in some parts of New England, and in fact almost half of the marble used in our country comes from Vermont, though much fine marble is now being quarried in Tennessee and Georgia.

In our visits to the quarries of Vermont we see that much more care is used in getting out marble than in quarrying granite. The rough blocks of marble are cut by means of sand and what might be called a sand saw. The saw is merely a long strip of steel. A little groove is cut in the stone, and this is filled with a very hard sand. Then the strip of steel is moved back and forth on the stone by machinery, so that it rubs the sand in the crack against the marble, and the sand does the cutting. After the stones have been sawed into the proper shapes they are carefully smoothed and polished, and are then ready for shipment.

But what kind of stone is of most use to a schoolboy?

Marble? No; this is chiefly for mantels, tables, tombstones, ornamental buildings, and other such things.

Granite? No; granite is used for building and other purposes where a strong and beautiful stone is required.

The stone which is used every day in many schools is slate. A large part of the slate comes from New England, although a great deal is quarried in Pennsylvania and elsewhere. Slate can be easily split into the thin sheets which are used for making slate roofs, and these sheets need very little preparation other than splitting and trimming. In making school slates the sheets have to be smoothed by rubbing them with sand and emery powder. A great many school slates are manufactured at Bangor, Maine, and we can there see boys and girls attending to machines which may have made the very slates that you are now using.

But there is another article made in New England which every boy and girl is glad to get. This is the maple sugar of Vermont. Maple sugar comes from the sap of the maple tree. The sap is gathered in the spring, after the first thaw, at which time it begins to move in the trees.

Holes are then bored in the trees not far above the ground, and little wooden tubes called spiles are driven into them. Soon the sap begins to flow. It oozes from the trees into the spiles, and drop by drop it falls into buckets that are hung beneath them or placed at the foot of the trees. As the drops hang on the end of the spile

Collecting Sugar Water — Vermont.

they look just like water. Catch one of them upon your finger and taste it. It is sweet, and the water in the bucket is called sugar water.

After the buckets are filled, which occurs perhaps once or twice a day, the sugar water is carried to the sugar house, where it is put in large kettles to be boiled. The sugar water grows thicker and thicker as the boiling goes on, until after a time it becomes a thin molasses and then a thick sirup. It is then poured into molds, and in a short time turns to sugar.

XI. IN BOSTON.

WE have no trouble in getting to Boston. It is the largest and wealthiest city of the northeastern section of our country. There are railroads to it from all parts of New England. It lies on one of the finest harbors of the Atlantic coast. It is so situated that it forms the best port for shipping the goods made in New England to other countries by sea, and one of the best points for shipping our farming products and other things to Europe.

Boston stands next to New York in the amount of its foreign commerce. Its good harbor allows the materials for manufacturing to be brought in so cheaply that it has become a great manufacturing city. There are almost a hundred thousand persons working in its factories. It has more than half a million inhabitants, and it is so surrounded by villages in which people live who do business in Boston that within fifteen miles of its center there are now living more than a million people.

As we walk through the business portions of Boston the crowds seem even greater than they were in New York. The streets here are narrow and crooked; the buildings are high; and some parts of the business section between Washington Street and Boston Common have so many people that the buildings make us think of enormous boxes divided into compartments packed with men carrying on different kinds of work.

We spend some time in Boston Common. This is a beautiful park in the heart of the city. Until about fifty years ago, when Central Park was laid out, Boston Common was the finest park in the United States. It is shaded by hundreds of old elm trees, and at one side of it there is

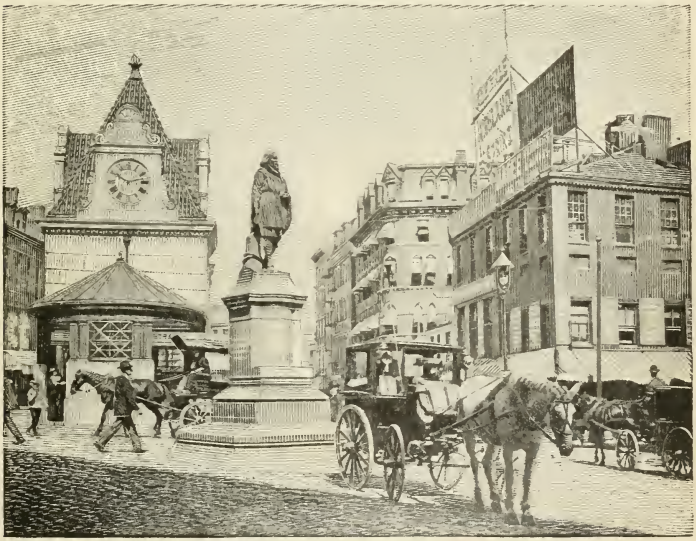
a great oblong building whose golden dome may be seen from almost every part of Boston. This is the statehouse, where the governor of Massachusetts has his offices and the legislature meets every year to make laws for the state. In the center of Boston Common is the Frog Pond, about which the Boston boys play in the summer.

Boston Common.

In our tour through the city we pass other fine parks, and learn that outside of the business portion there are many wide and beautiful streets. Commonwealth Avenue, for instance, is about one hundred feet wider than Pennsylvania Avenue in Washington, and through its center runs a park of trees, among which are footpaths. There are fine residences on both sides of the avenue, and at

night, when the street is lighted with four rows of lamps and the carriages of rich Bostonians are flying to and fro upon it, it presents one of the finest sights of the world.

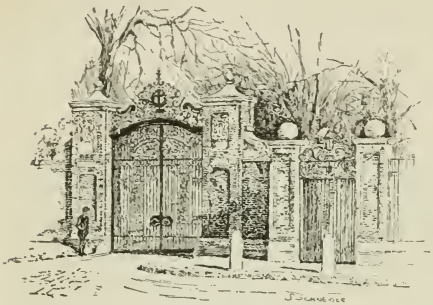
Boston people are noted for their learning and culture. There are many large book stores and publishing houses here, and the city has many libraries and museums. It



Scollay Square, Boston.

has musical, scientific, and other kinds of schools; and in Cambridge, one of its suburbs, we visit Harvard University, which is one of the largest colleges in the United States. It has more than three hundred teachers, and in its different departments there are more than three thousand students. Harvard is our oldest college. It was founded more than two hundred years ago, and more than

sixty years before Yale College was founded at New Haven, Connecticut. Yale and Harvard were for a long time the most famous colleges of our country; but today there are good schools and colleges in almost every part of the United States.



Harvard Gateway.

It was in Cambridge that General Washington first took command of the army of the Revolution. This was on the 3d of July, 1775. Boston was then in the hands of the British, and General Washington besieged it. We can visit Dorchester Heights, where Washington put his cannon during the last of the siege. From these heights he could fire upon the city and at the ships in the harbor, and he thus forced the British to leave.

Bunker Hill Monument.

New England people have always been noted for their bravery. Everywhere in Boston we see things which remind us of the stirring times of the past, when it took some courage to be a true American citizen. Let us take a street car and ride out to the Bunker Hill Monument. It stands on the site where the

Americans fought the British so bravely before Washington came. This section of Boston is now thickly settled, but the monument marks the place of the battle. It is a shaft of granite, the corner stone of which was laid by General Lafayette in 1825. There are steps inside of it by which we can walk to the top and look over the city. On the ground below us we see the statue of Colonel William Prescott, who commanded the Americans that day. It represents him as he looked when the English were coming, and when he held back his men until they could do the most damage, saying: "Don't fire till I tell you! Don't fire till you see the whites of their eyes!"

Later on, as we walk along the wharves of the harbor, we think of the famous Boston tea party. We remember how fifty Boston men and boys, disguised as Indians, ran yelling down to these wharves, and boarding the English ships which were loaded with tea for America, emptied the chests of tea into the water.

The English government had said that Americans must pay taxes upon their tea, but the Americans claimed that the English had no right to tax them without their consent. Hence they refused to drink tea, or to wear any kind of goods from England upon which they had to pay taxes. They decided to dress in clothes made in America, and began to drink tea of sage, sassafras roots, and other American plants.

When the English people heard how their tea had been destroyed in Boston, they became very angry, and the English Parliament said that no more ships should come into the Boston harbor until the city paid for the tea. This caused great trouble in Boston, and it aided in bringing on the Revolutionary War. To-day England is very glad to send goods to Boston without any tax. Into this same

harbor, which was then closed, now come much of the goods which our people buy of England, and out of it go vast quantities of products which they sell to her.

Old North Church.

We next visit the old North Church, in the steeple of which the lanterns were hung that night when the British soldiers started out to march against the Americans at Lexington and Concord. These lanterns were to tell Paul Revere, who stood on the opposite shore, that the British were coming, and that he should ride and warn the Americans to be ready to fight them. The ride is described in Longfellow's poem. It tells how Paul Revere, booted and spurred, stood by his horse and watched this church steeple until at last he saw the two lights burning which showed him that the British were coming. It describes how he sprang to his saddle, and then there was —

"A hurry of hoofs in the village street,
A shape in the moonlight, a bulk in the dark,
And beneath, from the pebbles, in passing, a spark
Struck out by a steed flying fearless and fleet;
That was all! and yet through the gleam and the light
The fate of a nation was riding that night;
And the spark struck out by that steed in its flight
Kindled the land into flame with its heat. . . .
You know the rest. In the books you have read
How the British regulars fired and fled, —
How the farmers gave them ball for ball,
From behind each fence and farmyard wall;
Chasing the redcoats down the lane,
Then crossing the field to emerge again

Under the trees at the turn of the road,
And only pausing to fire and load.

"So through the night rode Paul Revere;
And so through the night went his cry of alarm
To every Middlesex village and farm,—
A cry of defiance and not of fear,
A voice in the darkness, a knock at the door,
And a word that shall echo forevermore!
For, borne on the night wind of the past,
Through all our history, to the last,
In the hour of darkness and peril and need
The people shall waken and listen to hear
The hurrying hoof beats of that steed,
And the midnight message of Paul Revere."

The story of early New England is made up of fights with the Indians and fights with the British. Nearly all the ground over which we have traveled has been fought for again and again.

There are many places about Boston which will always be noted in the history of our country. Plymouth, where the Pilgrims landed after they crossed the ocean in the *Mayflower*, is only thirty miles away. We reach it by railroad in little more than an hour. It is now a beautiful little city of about eight thousand people, and as we look at its comfortable homes we cannot realize the hardships our forefathers suffered during their first winter in New England.

The *Mayflower* came into the harbor at Plymouth on a cold December day in the year 1620. She had just one hundred passengers. They had been driven from England to Holland on account of their religion, and they had now come to America that they might be able to worship God in their own way. They stepped from their boat upon a great stone, which has become famous as Plymouth Rock. This rock is now honored by all New England people, and we find it in Plymouth under a canopy of dressed stone, and notice that the figures 1620 have been cut upon its side.

Plymouth Rock.

From the time of their landing, the Pilgrims were in fear of the Indians. They had no houses at first, and in the rude huts which they put up they suffered such privations that more than half of them died within less than a year.

We find many relics of these times in Pilgrim Hall. Here is the very sword which Miles Standish, the sol-

dier of the colony, used in his fights with the Indians, and, what is even more interesting, the cradle in which the first white child born in New England was rocked. This cradle is a little wicker affair with rockers of wood. It is much like a basket with a sort of hood at the back. As we look we think of poor little Peregrine White—for that was the little boy's name—crying in it all alone, and can hardly realize how our country has grown when we are told that there are now more than two million babies born in the United States every year.

XII. FROM NEW ENGLAND SOUTH BY STEAMER.

WE leave New England to-day. We are bound for the lands of the sun. There are good steamers from Boston to all our southern ports, and we take ship for Norfolk, Virginia. We steam out of Boston harbor, and sail about Cape Cod, down the Atlantic coast, past New Jersey, Delaware, and Maryland, to the mouth of Chesapeake Bay. Much of the time we are out of sight of land, and it is about two days before we see the lights of Cape Charles, and steam over what is known as Hampton Roads to the mouth of the James River.

Captain John Smith.

Here on our left is the thriving seaport of Norfolk, and upon our right Old Point Comfort, where Captain John Smith landed with his party from England when he first arrived in America in 1607, thirteen years before Plymouth

was founded. Captain John Smith stopped for a time upon this point, near where the little town of Hampton now is, before he sailed up the James River to found Jamestown.

It was at Hampton that Captain John Smith had his first meeting with the Indians. There are Indians at Hampton now, and we find them more friendly than those who greeted John Smith. Our Indians are far different from the half-naked redskins, with paint on their bodies and feathers on their heads, who roamed through America when the English colonists first came. The Indians we see belong to the large Indian college at Hampton which is supported by our government. Here Indian boys and girls from many of the savage tribes of the West come to school. They dress as we do, and learn to speak and read and write English. The boys are taught trades; the girls are taught to cook and sew and keep house, and all learn how to lead civilized lives.

The air is warmer at Hampton than it is in New England. We see other plants growing, and there are many things about us which show us that we are in a different part of our country.

What a great number of colored people are here!

More than half of the folks we meet in our drives are colored. We are now in Virginia, the lands of which, like those of the states farther south, once composed large farms or plantations, worked by negroes as slaves. These people belong to a different race from the whites. The first of them were brought by force from Africa to America to be used as slaves. They remained in slavery until they were freed during the great Civil War between the North and the South. After the war was over nearly all the colored people remained in the South. In some

southern states, such as South Carolina and Mississippi, there are now more colored people than whites, and, indeed, there are so many of them that they make up about one tenth of all the people of the United States.

Our colored people are, as a rule, good citizens. Some of them now own farms. Many send their children to school, and we find colored boys and girls who are being educated at Hampton College with the Indians. They are anxious to learn, and some of them are bright students.

But let me tell you an interesting thing about Norfolk. You may know that it has a good harbor, for it is at the mouth of the James River, and large steamships can come to its wharves. You may have heard that many millions of oysters are brought here in the shell from the beds at the mouths of the rivers which flow into Chesapeake Bay, and that they are here shucked and shipped to the markets all over the country.

These are not the things I want to tell you about. It is about the peanuts. Norfolk is the chief peanut market in the United States. From here tons of peanuts are sent out every year, and we may see peanut fields all about Norfolk, and also in other parts of Virginia, and in North Carolina, Georgia, and Tennessee.

When we think that peanuts are usually sold in small quantities, at five cents a pint, we can hardly believe that the peanut crop can be of much value. Still, this is the case. There are so many pints of peanuts sold every year that altogether they make up about four million bushels, and a good crop sometimes brings as much as ten million dollars.

Many of our peanuts are shipped from Norfolk to Europe. There they are put into presses, and the oil is squeezed out of them by heavy machinery. Peanut oil

is used by some people in Europe for salads, and for other things, in which it takes the place of olive oil.

But how do you think peanuts are raised?

They do not grow upon trees, nor are they found on bushes. They grow underground, and might be called ground pease. They are planted just like vegetables or corn. The peanuts are first shelled, the farmers being careful not to break the little red skins on the kernels. It takes about two bushels of nuts in the shell to furnish the seed for an acre, and an acre planted with peanuts will produce, according to the richness of the soil, from twenty to one hundred bushels of nuts.

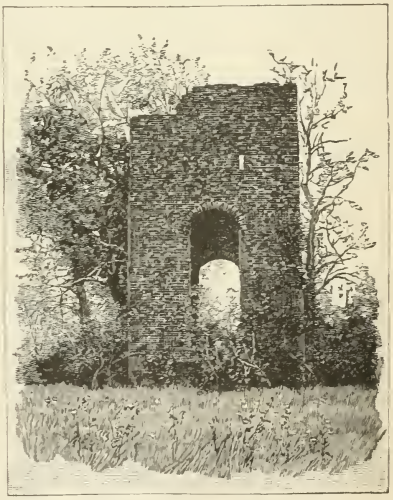
A Peanut Vine.

The nuts are planted in hills or are drilled in rows, much like potatoes. They are plowed and hoed to keep down the weeds. The planting is done in May. Soon the little green vines peep forth from the ground. They spread out over the hills, sending out little stalks on which the flowers grow. These with the seed pods finally run down into the soil where the seeds ripen into peanuts.

In the fall the peanuts are ripe. They are then dug up. The vines are pulled out, and after the dirt is shaken off they are stacked about poles seven feet high, with the nuts hanging to them. About two weeks after this the

nuts are picked from the vines by women and children, who are paid so much a bushel.

The nuts are still covered with dirt, and the next process is cleaning. This is done by machines much like the windmills used by farmers for cleaning grain. After cleaning, the nuts are sorted by colored women and children, who pick out the bad ones as the nuts pass by them on a moving belt about a yard wide. The peanuts are now ready for market. They are put into bags and shipped to all parts of the world.



Tower at Jamestown.

From Norfolk we take the steamer which sails up the James River daily to Richmond, the capital of Virginia. The James is very wide for some distance from its mouth. The lands along its banks are low, and the soil seems good. As we look at the rich farms on both sides of us, we can imagine how happy Captain John Smith and his company felt as they sailed over this same river now almost three hundred years ago. We have traveled but a few hours before we reach the point where they stopped and began building what they thought was to be the great city of the New World.

This was Jamestown, or, as they called it, James City. It was the chief town of Virginia when Virginia included

all the land on our eastern coast from Maine to Georgia. New England was called North Virginia at first, and it was not until Captain John Smith visited it later on that it was named New England.

There is nothing like a city now at Jamestown. All that was left when I visited it a year or so ago was the ruined ivy-covered tower of the church. This stood upon an island in the river. The waters, I could see, were fast eating away the banks of the island, and it must soon all disappear. Not a man was in sight. The only sign of life about the ruins was a cow, which was eating grass near by; and the only sound I heard from the mainland, as we sailed past, was the croaking of a frog that was peeping out of the water by the bank.

The Jamestown colony had indeed a much worse time than the Plymouth colony. The Indians fought them. The redskins hid themselves in the woods about the little settlement and for a long time killed every one who ventured out. They besieged Jamestown, so that at one time the colonists could get nothing to eat. During this time they ate dogs and horses and all sorts of reptiles, such as snakes and toads. This was when the colony had grown to the extent of five hundred by the landing of more ships from England. The time was known as the Starving Time; and when it ended with the arrival of a shipload of provisions, only sixty out of the five hundred were alive.

You would think that with such troubles the English would have given up trying to settle America. The colonists found no gold as they had been told they would. They saw, however, that the land was rich, and as time went on they found that there was much money to be made in the raising of tobacco.

We do not think it is good for men to use tobacco.

Still this plant has had a part in the history of our country. It is to-day one of our most valuable crops, and we decide to go south from Richmond to visit some of the plantations and learn how it is raised.

No one in Europe knew anything about tobacco until Columbus discovered America. The tobacco plant was first found on our hemisphere, and one of the most wonderful stories which the explorers told, when they returned to Europe in those early days, was how the Indians ate fire and breathed smoke out of their nostrils. Many of the travelers learned to smoke as the Indians did, using pipes, and blowing out the smoke through their noses. They introduced the custom into Europe, and tobacco-smoking became fashionable among the ladies and gentlemen of that time.

Sir Walter Raleigh was one of the first smokers in England. One day, it is said, when he was smoking his pipe a servant came in with a pitcher of ale in his hand. This man had never heard of tobacco, and when he saw the smoke coming out of Raleigh's nose he thought his master was burning up, and threw the ale over him to put the fire out. Raleigh had sent several expeditions to America, and Ralph Lane, the captain of one of these, brought some tobacco home with him.

As the custom of tobacco-using grew, tobacco became very valuable. It was long the chief crop of Virginia. At one time the colonists used it as money, so that a man could take pieces of tobacco to the store to buy sugar and tea and other things for his table.

We now sell vast quantities of tobacco every year to the people of Europe, Asia, Africa, and South America. More of this article is produced in our country than in any other. Our tobacco crop is sometimes worth as much as

forty million dollars, and the largest part of it is used in other lands.

Tobacco is now raised in almost every one of our states and territories, but the chief tobacco lands are in Kentucky, Virginia, North Carolina, and Tennessee. The

Tobacco Field.

climate and soil in parts of these states seem to be just fitted for raising tobacco, and we see tobacco fields everywhere as we ride along the southern boundary of Virginia and into North Carolina. The leaves of the tobacco plant are much like cabbage leaves, but they are longer and smoother and of a dark-green color. The stalks on which the leaves grow are as big around as our thumbs, and some are so tall that if we stripped off the leaves we could use them for canes.

It is by no means an easy thing to raise tobacco. The seed must first be planted in a sort of hotbed or plant bed. This bed is made by covering a piece of ground with wood, and burning it, so that all the insects, vegetable matter, and seeds in the ground are cooked out. After this the bed is manured. Then the seeds are sown, and a

Tobacco Auction.

wide sheet of very thin cloth is spread out above the bed to keep in the heat and keep out the insects.

How big do you think a tobacco seed is?

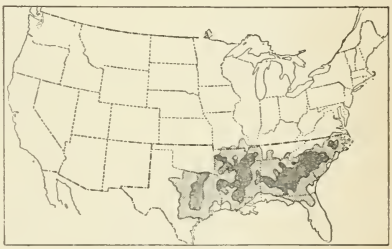
It is so little that you could put a million of them in your pocket. It is not bigger than a mustard seed, and one ounce of tobacco seed contains, it is said, three hundred and forty thousand seeds. The seeds are so small that they have to be mixed with ashes or dirt before planting, in order that they may not be too thickly sown.

The planting is done in the spring. After a short time the little green tobacco sprouts come up, looking much like cabbage plants. They are now taken up and set out in hills, four thousand plants to the acre. They are carefully cultivated throughout the summer and are harvested in the fall. As the plants ripen the leaves become yellow. At this time the tobacco farmer cuts the stalks off close to the earth and hangs them on sticks which are stuck in the ground. In some places the farmers strip the leaves from the stalks and string them on wire.

The leaves must now be dried and cured before they can be sold. All of the moisture must be taken out of them. This is done in what are known as tobacco barns. We see these barns on nearly every little farm as we ride through the tobacco lands. They are usually wooden cabins without windows. In each of them there is a heating arrangement consisting of a stove with flues or pipes which run through the barn. The tobacco is hung up in the barn, and the place is kept as hot as an oven, day and night, until the tobacco is thoroughly cured. The leaves are then tied up in little bundles and carried to market. Much of the tobacco is sent to the factories in the United States to be prepared for smoking and chewing, and for making cigars and cigarettes.

XIII. IN THE LAND OF COTTON.

LEAVING the tobacco lands, we move on farther south, and soon find ourselves in the great cotton belt of the United States. This begins in North and South Carolina and runs down through Georgia, Mississippi, Alabama, Louisiana, Arkansas, and Texas. There is a little cotton raised in some other states, but these states produce the greater part of our crop, Texas producing the most.



The Cotton Belt.

Do you realize how important the cotton crop of our country is? It is so valuable that if all the gold dug in one year from all the mines on the earth were put in one pile, and that part of our cotton crop which we send each year to Europe were stacked up beside it in another, the cotton pile would be worth the most.

We often get more than twice as much from our cotton fields as from our gold and silver mines. We raise the best cotton in the world, and about two thirds of all the cotton clothes worn by men is made of the woolly fiber from our plantations. There are yellow-skinned people in Asia, black-skinned people in Africa, red-skinned Indians in South America, and white-skinned people in Europe all dressed in our cottons, and every one of us wears more or less cotton cloth. We do our sewing with thread that comes from this plant. Our common dresses and

shirts are made from it, and we sleep at night between sheets the material of which was once fluffy cotton.

But why does America produce so much more cotton than any other country?

It is because our soil and climate are best fitted for it. Cotton requires a warm climate with not too much moisture. This is found in our cotton belt, and the best place of all for cotton is on the string of islands which lies off the Atlantic coast in the states of South Carolina and Georgia. Upon these islands grows what is known as the sea-island cotton. The plants here are four or five times as large as those in other parts of our country. The ripe cotton upon them shines like satin, and it is made up of fibers which are longer than those of any other cotton. There is some cotton in Egypt which is almost as good as the sea-island cotton, but there is not much of it in comparison with the vast amount produced every year in America.

Have you ever seen a cotton field?

A field of ripening cotton forms one of the most beautiful sights in the world. There are acres of plants, which are about as high as your waist, and on all of them are white bunches of cotton which look like soft balls of snow.

We pass many such fields in our travels. They line both sides of the railroads. Some of them are dotted with people who are picking the cotton. Negroes and whites walk through the rows and pull the soft white lint from the stalks. The pickers sing as they work, and their rich, soft voices float into the car windows as we ride by.

At many of the stations there are huge packages or bales of cotton ready to be shipped to the factories of New England or those of other parts of the country. Some are to go to the seaports, where they will be rebaled and shipped off to Europe. Every little farmhouse we pass

has one or more bales in its yard. Upon the country roads we see wagons filled with what in the distance looks like newly washed wool, but what is really freshly picked cotton. It is being carried to the gin, where the seeds must be taken out before the cotton can be sold.

But let us stop and visit one of the big cotton plantations of South Carolina. There is a field which is not yet ripe. It is filled with green plants just about as large as currant

Picking Cotton.

bushes, upon which are the green bolls containing the cotton. The largest bolls are about the size of a walnut with the hull on it. Farther over we can see a field in which some of the bolls are cracking open, and the green bushes seem dusted with white. These bolls are almost ripe, and the cotton will soon be ready for picking.

Look farther over. There is a spot where the land must be richer, for the bolls on the lower branches are all open, and great tufts of white, as large as pop-corn balls,

hang out as if ready to drop into the hands of the pickers. But the bolls on the higher branches are still closed.

Let us go into that ripening field and examine the cotton. Pull some bunches of white from the bolls. How easily they come out, and how soft and clean the stuff is! What are those hard little things we feel inside the white wool? Let us pick apart the cotton and see. Those are the cotton seeds. They are as big as the seeds of a lemon, and they must all be gotten out before the cotton can be sold. We shall see how this is done later on.

Cotton Bales Ready for Shipping.

It is from seeds like these that the cotton plants grow. We ask the planter how cotton is raised, and he tells us that his crop was planted in April, in rows of hills three feet or more apart. He describes how the sprouts soon came through the soil, and how by the middle of June this field was filled with green plants upon which were many beautiful flowers. The blossoms of the cotton plant look a little like roses. On first opening, they are white; the next day they are red, and as you look over a cotton field in blossom you seem to see acres of beautiful roses. Soon the blossoms drop off and the bolls of cotton appear. The bolls do not crack open until they are ripe, and then the beautiful white fibers show out.

From what we have seen we know that the plants do not all ripen at once. The pickers have to go over a field many times. The picking season in the far South and in Texas begins in July. Farther north it begins later, and in Georgia and South Carolina some of the cotton is often still on the stalks at Christmas.

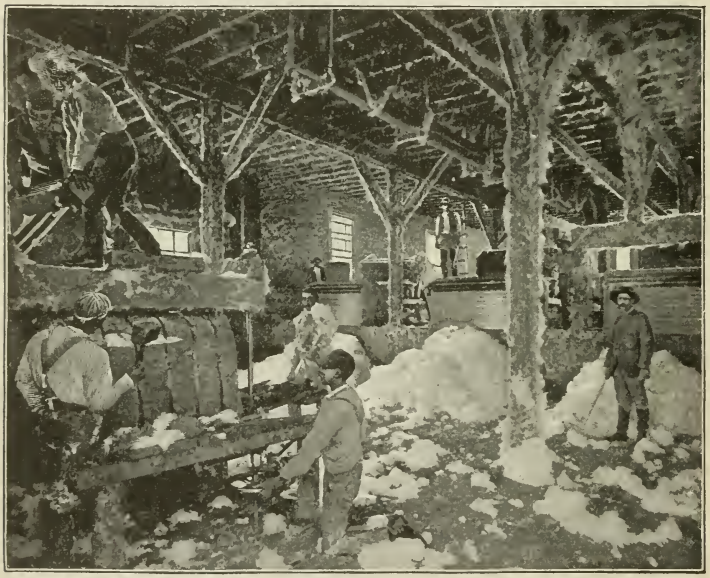
After the cotton is picked it is carried in wagons to the gin. There goes such a wagonload now. Let us jump up into the wagon and go along with it. The negro driver is very good-natured, and he laughs loudly as we climb on the load of the fleecy white cotton. At the ginhouse we crawl out, covered with lint, and look on as the cotton is thrown into the top of a machine so that it falls between fine circular saws so arranged that the seeds will just pass between them. The cotton is caught by the teeth of the saws, while the seeds drop below.

Between the saws there are stiff brushes which pull the cotton out of the saw teeth and roll it out in a beautiful, fleecy sheet, so that it drops on the floor on one side of the gin looking like a great drift of snow.

The cotton is now ready for baling. By this is meant putting it in such bundles that it may not take up much space on the cars or in the ships upon which it is to be carried to the markets. This is done by great pressing machines, which squeeze the cotton together so that a great quantity of it is put into a package about four feet square and five feet in length. It is next wrapped in rough cloth much like coffee sacking, and is bound with bands of hoop iron. The ordinary bale weighs from four hundred and fifty to five hundred pounds, and is worth from thirty to forty dollars, though its price may vary above or below this, according to the size of the crop of cotton raised in different parts of the world.

But what becomes of the cotton seed?

This is very carefully saved. It is so valuable that it is estimated that the cotton seed raised in America is worth more than one hundred million dollars a year. A few years ago it was not supposed to be worth anything, and it was burned or thrown away as useless. Now the seeds



Baling Cotton.

are saved for the making of oil and other things. They have a great deal of oil in them. They are first ground, and the oil is then squeezed out in great presses.

Cotton-seed oil is largely used for the making of soap. Much of it goes into certain kinds of patent butters, such as oleomargarine, and a large part of it, when purified, is used for cooking, for salads, and for other things where it

takes the place of olive oil. Indeed, it is said that a large percentage of the olive oil sold in the United States is really cotton-seed oil. Many of the laborers who work in the cotton-seed-oil mills do not butter the bread which they take with them for their lunches. They use the oil in place of butter, putting the slices cut from the loaf under the press, where the sweet, warm, fresh oil is trickling out, and then eating them with a relish.

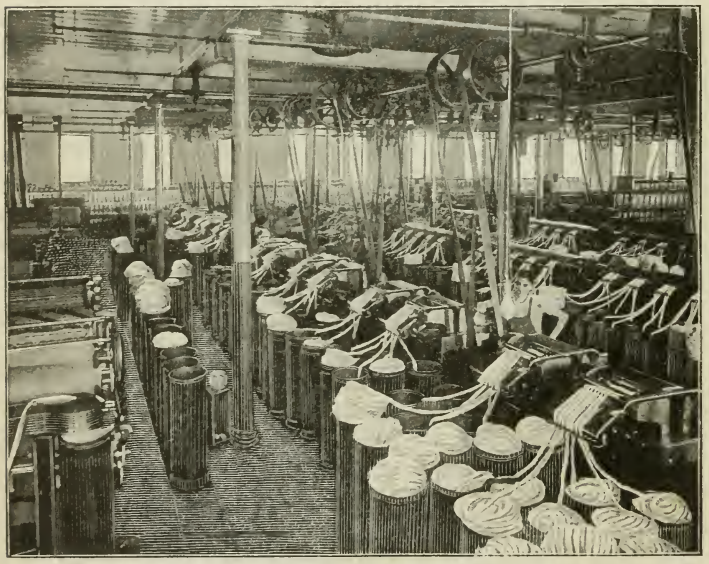
But let us follow the cotton wool still further, and see how it is made into cloth. Until within recent years all of our great cotton factories were in New England. We saw many at Lowell, Fall River, Manchester, Lawrence, and other cities as we passed through, and we know that the most of our cotton is still made there. We find, however, that many great factories are now being built in the South. There are large factories at Charlotte in North Carolina, at Spartanburg, Greenville, and Columbia in South Carolina, also at Atlanta and Augusta in Georgia. The cotton states have good water power, and the cotton is so near to the mills that they can make cloth very cheaply.

The factory we visit is at Spartanburg, South Carolina. It is in a brick building covering several acres of ground. The factory has three stories, made up of large rooms filled with interesting machinery, and there are hundreds of white men and women at work within it. The cotton is taken almost directly from the gin to the factory. We can imagine ourselves to be following a bale as it passes through one room after another, until what was at first only a great bag of white stuff is turned into cloth.

How is it done?

It is not an easy thing to make this cloth which we buy for a few cents a yard. Take a piece of cotton batting, for

this is much like the cotton as it lies in the bale, and pull it apart. What queer stuff it is! It is made of thousands of little white hairs, so fine that several of them twisted together would not equal the thickness of one of the hairs of your head. These little cotton hairs are called fibers. They are not as long as your finger. There are millions

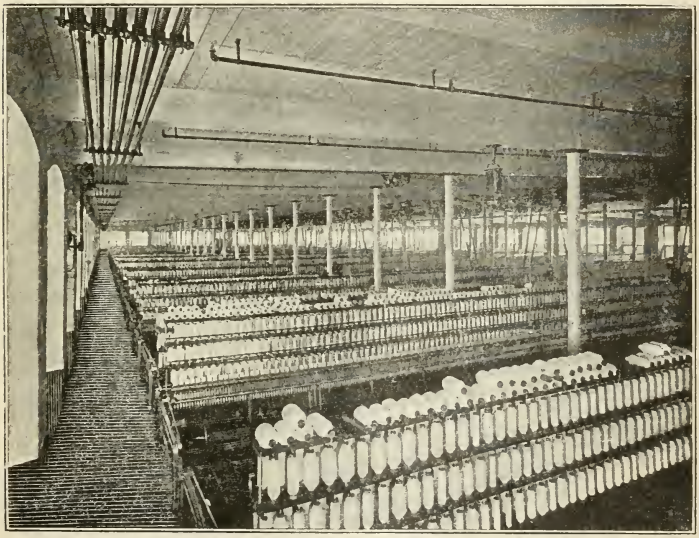


Making Cotton Threads.

of them in a few pounds of cotton, and in our big bale there are probably more of those little hairs than there are people in the United States. Still, of the little cotton hairs the strongest of cloth and thread are to be made.

Now let us follow our bale as it goes through the mill. It is first taken apart, and the cotton is thrown upon great cylinders or rollers called openers. These pull the hairs

apart and separate each of them as far as possible from the others. The cotton thus loosened is passed through other rollers the sharp teeth of which pick out the dirt, so that when the cotton comes from them not a stick, a leaf, or a grain of sand is left in it. It now feels very soft and is even whiter than it was in the bale.



Mule Spinner.

The next process is called carding. Here the cotton is run through rollers covered with little wire teeth so fine that there are more than a score of them on a space as large as your finger nail. These little teeth brush and comb the cotton much as you comb your hair. As the cotton passes through them they pull the tangled hairs apart and make them lie almost altogether one way, so

that when they come out at the other end of the rollers they are in the shape of a rope of soft cotton yarn. It is of this rope that the threads are to be made.

The rope is as big around as a broomstick. It looks big enough to make a dozen threads, but it is not nearly large enough to make one. It is as soft as down. It is doubled again and again as it goes through machines which twist it finer and finer, until at last it is not bigger around than a fishing line. It is still soft, however. Another strand of the same size, which has been twisted from another cotton rope, is now joined with it, and the two are twisted and retwisted by machinery until they are as small as the finest cotton thread used for sewing. This is the thread for the cloth.

As the thread comes from the machines some of it is rolled upon long spools, called spindles, by what is known as the mule spinner. The mule spinner takes the place of the old spinning wheel, save that it winds hundreds of spools at one time, one machine often doing as much work, perhaps, as a thousand women could do. Some threads are wound upon rollers or beams of the width of the cloth to be made. These threads are to be the long threads of the cloth.

The short threads, or what is known as the filling, are first wound upon small bobbins, and then are thrown from one side of the cloth to the other by the shuttle, which carries the thread back and forth through the long threads at the rate of one hundred and fifty times or more a minute. This is called weaving, and the machines with which the weaving is done are the looms. The machinery in the weaving rooms makes a great din, and the looms work so fast that thousands of yards of cloth are woven in one factory in a day.

XIV. AMONG THE RICEFIELDS.

WE see more and more cotton as we go farther south into Georgia. There are cornfields here and there. We visit great peach orchards, and ride through fields devoted to the raising of watermelons for the markets of the North. There are even more colored people here than

Ox Carts.

in Virginia, and we see scores of them at the stations, in the fields at work, or standing in the doors of their little cabins, watching the train as it goes whizzing by.

How many mules there are! In some sections of the southern states there are more mules than horses. Now and then we see a negro driving an ox hitched with rope harness to a rude, old-fashioned cart.

The towns we pass are not so large as those of New England, but new buildings are springing up about many of them, and near each of the cotton mills there is a little colony of new houses.

At Atlanta we find one of the most beautiful and most thriving cities of our southern section. It is a great business and manufacturing center. It is situated so high above the sea that it has a delightful climate in the summer, and it is so far south that its winters are not cold. We spend some time in the handsome state capitol, take a stroll under the old forest trees along Peachtree Street, upon which are some of the finest houses of the city; and then we go out upon the electric cars to see the battlefields where some terrible fighting was done during the Civil War.

Rice.

Atlanta has railroads branching out in every direction, and we get cars here which carry us eastward to the Atlantic Ocean. We visit the islands off the coast where the famed sea-island cotton is raised; and along the lowlands bordering the Atlantic we travel through a country spotted with fields of rice. The rice is now almost ready for cutting. It is of a bright yellow color, and at first sight it makes us think of wheat or oats. As we get nearer we see that the straw is different from wheat straw, and that the little grains upon it are not at all like any grains raised in the North.

We can see water shining out in the fields at the roots of the plants, and we are told that the best rice is raised where the ground can be flooded with fresh water, and

that a great deal of moisture is needed to develop the crop. The plants must also have plenty of hot sun, and hence we find the best rice-raising lands of the United States in the lower parts of the warm South Atlantic coast and in the hot, moist country about the mouth of the Mississippi River. The states of South Carolina and Louisiana, in fact, produce the most of the rice raised in the United States, and the chief rice-shipping ports are Charleston, Savannah, and New Orleans.

But let us visit one of the rice plantations near Charleston, South Carolina. We shall learn that raising rice is by no means an easy thing. The fields have little banks about their edges, so that the water, when let in upon them, will stay there, forming a pond covering the whole field. The plants are grown in the mud. The beds are flooded, and in a short time the sprouts poke their little green heads up through the water. After this the water is drawn off until the stalk forms a joint. The plants are then plowed and hoed. They are again flooded, and the water is allowed to remain about their roots until the straw turns yellow, when the rice is ripe and ready for cutting.

Rice is harvested much as wheat and oats are harvested. The straw is cut and shocked up in the fields, and after a short time thrashed to get the grain out. When the thrashing is done the process of preparing the rice for the market has only begun. Each little grain of rice has a hull on it, which does not come off in the thrashing. This hull sticks as tight to the grain as though it were glued, and the rice, before it can be sold, has to be cleaned by running it through hulling machines. As it comes out of the machines it is rough, and other machines are used, in which each grain of rice is rubbed and polished until it is smooth and glossy.

Some rice is raised on the higher lands without water. This is known as upland rice. It is grown in almost the same way as wheat and oats are grown in the North.

The greatest ricefields of the world are in Asia, where the rice is raised in flooded fields. In some parts of that continent so many people eat rice that it takes the place

A Ricefield.

which bread has with us, and, indeed, it is said that one fourth of all of the people of the world live upon rice.

Have you ever heard how rice first came to America? There were no rice plants here until about two hundred years after Columbus discovered this continent. Take your map of Africa, and find the island of Madagascar, which lies off its east coast. It was from that island

that a ship started out in 1694, and after a long voyage came into the Atlantic Ocean, and was driven by a storm into the port of Charleston. The captain of the steamer had a sack of rough rice with him. Upon leaving he gave the rice to one of the citizens of Charleston, who planted some of it in a low place in his garden. A big crop was the result. This man gave the seeds to his friends, and within a short time rice became one of the chief products of this part of the United States.

A Street in Charleston.

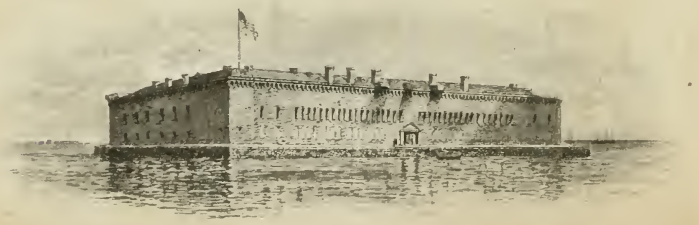
We see bags of rice ready for shipment on the wharves of the Charleston harbor. There are steamers loading cotton for Europe, and other ships which are being filled with a sort of rock dug from the ground near here, which is of great value for fertilizing.

Charleston is one of the most interesting cities of the South. It is built on a peninsula formed by the mouths of the Ashley and Cooper rivers. It is laid out in square

blocks, the cross streets extending from river to river, and the other streets cutting them at right angles. Charleston is a very old city; it was founded only sixty years after the Pilgrims landed at Plymouth; and it has always been noted as an important commercial point. Many of its streets are wide, and some of them are lined with great houses, at the sides of which are broad lawns and gardens. Many of the old mansions have big pillars in front and at the sides, which support porches or galleries, forming cool places during the hot summers.

Back of some of these old houses we can see the quarters and cabins which were occupied by the negroes in slave times; and we meet so many colored people on the streets that we are reminded that South Carolina has a large number of this race among its inhabitants.

After a walk along East Bay Street, we take a stroll upon the Battery, facing the sea. We then get on the little steamer which goes several times a day to the most interesting points in the harbor. We visit Fort Sumter, where the first shot was fired at our flag at the beginning of the great Civil War. The fort is on a little island not very far from the shore. The island is made of rocks. It is surrounded by brick walls about forty feet high and eight feet thick. Grass-covered earthworks are still to be seen on some parts of the wall.



Fort Sumter.

XV. A VISIT TO A TURPENTINE FARM.

LEAVING Charleston, a few hours' ride by rail to the southward brings us to the great seaport of Savannah, near the mouth of the Savannah River. Savannah is famous for its cotton presses and rice mills, and is especially noted as the chief port of the world in its shipment of turpentine and rosin. At certain seasons of the year the wharves of Savannah are covered with barrels of such stuff, awaiting the ships that are to take them to Europe. Large quantities are also being loaded upon cars and steamers to be sent to every part of the United States.

On the Wharves at Savannah.

Turpentine and rosin are made from the sap or gum of the long-leafed pine tree. Turpentine is the liquid white spirit which is used in making varnish and other things. Rosin waxes the bows of violins; it is also used in the

manufacture of soap, and it is especially valuable for varnish. The furniture which we use is probably varnished with the juice of the pine trees of the forests of Georgia or the Carolinas, and from the same source comes the turpentine used to mix the paint on our houses.

The process of getting out turpentine and rosin is known as turpentine farming. A turpentine farm is perhaps the queerest kind of a farm in the world. It is a forest of pine trees, each of which has been so cut and scarred that the sap oozes out and may be collected for making turpentine. There are farms of this kind all along our South Atlantic coast from North Carolina to Florida, and farther inland along the Gulf of Mexico to Louisiana. These regions have forests so vast that you might travel for miles through them without seeing a human being. You would meet with few cultivated spots, and would see little else than trees, trees, trees, and now and then gangs of men getting out lumber or gathering turpentine.

For many years the most of our turpentine came from the woods of North Carolina; but turpentine farming soon kills the trees, and the pine trees there are now almost used up. The best turpentine farms are now farther south. There are hundreds about the cities of Savannah and Brunswick, and we shall see them in Alabama, Louisiana, and other parts of the South.

Each farm consists of thousands of pine trees. The trees are not large around, but they are perfectly straight, and so tall that they sometimes reach to the height of an eight-story house before their branches begin.

There is little underbrush in such forests, and we can easily walk through the woods. Every tree has one or two scarred places upon it where the bark and wood have been chopped off. These places begin at the foot of the

tree and extend upward as high as your waist. As we look we see that a hole or box has been cut in the tree at the foot of each scarred place, and that the white sap is oozing from the wood and running down into the box.

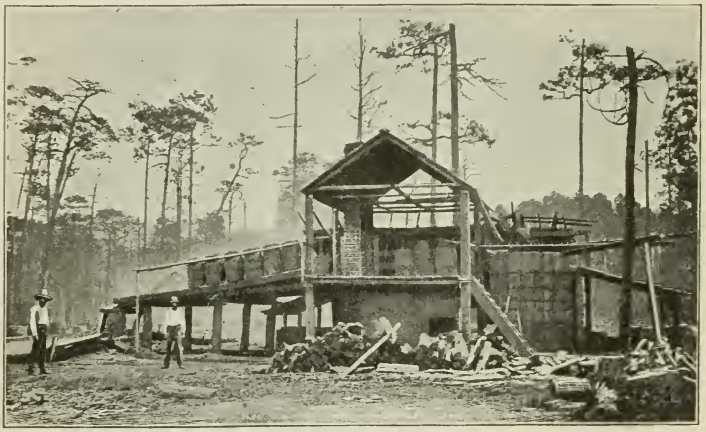
The size of a turpentine farm is known by the number of boxes. Ten thousand five hundred boxes make what is called a crop. There are farms which have millions of boxes, and in which, during the fall and winter, hundreds of negroes are kept busy scarring the trees and cutting out the boxes. The men labor in gangs, under an overseer. Two men work together, taking a tree at a time. One man stands on each side of a tree, with an ax in his hand, and they chop in turns. For this reason, whenever it is possible, a right-handed man and a left-handed man work together.

Scarring the Trees.

The gathering of turpentine begins as soon as the sap moves in the spring. At this time it oozes out in thick white drops on the cut places and falls down into the boxes. It soon hardens, forming a gum about as thick as molasses.

Every few days the boxes fill up, and the men come along and scoop out the liquid. Each man has a keg with him, and he empties the sap into it as he goes from tree to tree. When his keg is full he carries it to a barrel, in which it is taken to the turpentine distillery.

The trees must be cut again and again during the summer to keep the wounds fresh. Such drops of the sap as harden are scraped down into the boxes. The next year a place is cut out on the tree a little higher up, to furnish turpentine gum for the next season, but that of the second



A Turpentine Distillery.

year is not so good as that of the first. The sap grows darker from year to year, and after five or six years the tree gives forth sap so dark that it is not valuable, and the tree is ready to die.

But let us follow the barrel which we have seen filled with the juice of the pine tree, and see how it is turned into rosin and turpentine. As the sap oozes out it is of a waxy, gummy nature. The question is to get the turpentine out. It will take eight barrels of gum to make two barrels of turpentine, and what remains will be rosin.

This is done at the turpentine distillery. We can tell we are nearing it long before we get there by the smell of

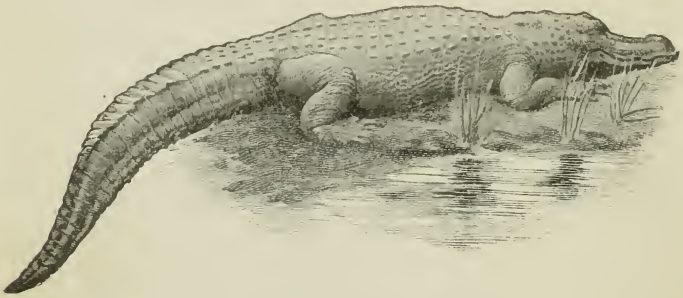
the rosin. It makes us think of a big canning factory, the smell is so like that of the wax used for sealing the tops of fruit cans. The odor grows stronger as we approach the big shed of the distillery, and we now perceive that the smell comes from the gum as it is being boiled to get out the turpentine.

Let us see how this is done. The gum is first mixed with water, and then put into a great kettle set in a brick furnace in which hot fires are kept. As the gum melts, the turpentine in it rises up in a vapor and goes off into pipes kept cold by causing streams of spring water to flow over them. As the vapor enters the pipes it condenses, turns to a liquid again, and at the end flows out in a stream of clear white turpentine. It is now run into barrels, and shipped to the markets. The rosin which has been left in the kettle by the boiling has become thick. It is also put into barrels, where it soon hardens, and is then ready for sale.

It is from the same kind of trees that produce the turpentine that some of the most valuable lumber of the United States comes. At every few miles along the railroads there are sawmills where such trees are being made into lumber, to be shipped to all parts of the United States. This lumber is sometimes known as the Georgia yellow pine. It is used largely for floors and the inside woodwork of houses, and there is scarcely a lumber yard in the northern part of our country where you will not find some of it.

The forests of the South are of great value. Many railroads are now built to bring the lumber to market, and there are vast stretches of country in this part of the United States which are nothing but woods. There are many swamps which contain cypress trees, gum trees, and other good timber. Some swamps are so large that they

have never been explored, and the Okefinokee Swamp in Georgia has regions which are as dense as the jungles of tropical countries. These swamps have many quagmires in which a horse or a man might sink out of sight. They contain all sorts of snakes, and in some of the swamps of Georgia and Florida alligators by the hundreds crawl through the muddy waters.



XVI. FLORIDA AND ITS ORANGE GROVES.

NOW suppose we take a run down into Florida. This peninsula forms the southeastern end of our Atlantic coast. It is one of the tropical parts of the United States, and very different from the lands farther north. Much of the peninsula is low and sandy, and the Everglades, at its southern end, are largely made up of swamps. Some parts of Florida are so near the level of the sea that it looks as though the waters might rush in and drown the people. At the end of the peninsula the land drops out of sight, a little hill poking its head up here and there through the water, and forming the Florida Keys, which

end in Key West. Key West is a habitable little island having a well-fortified harbor. The people are chiefly engaged in making the Key West cigars.

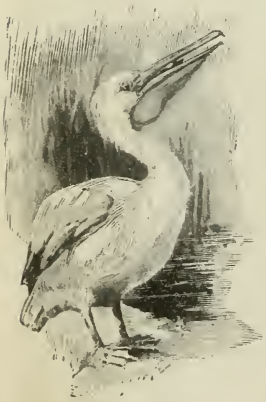
The railroad from Savannah brings us first to Jacksonville, on the St. Johns River. Jacksonville is the largest city of Florida. It is the chief seaport of the state. The

Live Oaks and Spanish Moss.

ocean steamers sail to it up the St. Johns, which at this point is so wide that it looks like an arm of the ocean. We find many ships at the wharf, and there are side-wheel river steamers, upon which we shall travel far up the St. Johns into the heart of Florida.

Leaving Jacksonville, we go for a long distance through what seems to be a great inland lake. We sail for miles

and miles before the river grows narrower, and we then pass through forests of palmetto trees, live oaks, and cypresses, the branches of which are loaded down with Spanish moss. This moss looks much like frosted silver. It is a sort of air plant which crawls all over the trees, hanging down from the limbs, and in some places almost reaching the water. Much of the earth along the banks is sandy. We miss everywhere the green turf which we have in other parts of our country; and although our surroundings are beautiful, we long for the velvety grass of the North.



A Pelican.

We find, however, that every part of the world has its own beauties. The wild flowers of Florida comprise many that are grown in northern hot-houses. In some places we go through jungles so dense that we imagine ourselves in the hot lands of Africa. The very air feels different. It is soft and balmy in the evenings and mornings, but at midday, even on the river, the sun is so hot that we have to keep under cover.

We see curious birds on our voyage. There are herons and buzzards; and long-legged cranes and big-throated pelicans stand in the mud on the edge of the river. Now and then we see alligators scrambling down the muddy banks as they hear the noise of the boat.

The streams which flow into the St. Johns furnish excellent fishing. Florida is one of the best fishing grounds in the United States. It is the home of the tarpon, the biggest fish we have that can be caught with a hook. Many a tarpon, if it stood upon its tail, would be as tall

as a man, and some have been caught which weighed more than one hundred and fifty pounds. Tarpon fishing requires a very strong line. The sportsman has often to fight with the fish for hours, letting it run this way and that with the hook until it is tired out and can at last be dragged to the boat.

We go quite a long distance up the St. Johns before we reach the best orange-growing districts of Florida. There

An Orange Orchard.

are oranges in all parts of the state, but those of the north are likely to be spoiled by the frost. There are some excellent groves on what is known as the Indian River.

We have no trouble in getting a permit to visit the orchards. Oranges are as common in Florida as apples are in New York or New England, and we are asked to go in among the trees and pick all we can eat.

How delicious the oranges taste when they come from the trees! They are more juicy than any we can buy in the stores. How full the trees are! Some of them are so loaded with fruit that the golden balls shine out everywhere through the emerald-green leaves. It is said that there are some trees in Florida which bear as many as five thousand oranges in a single year.

A Pineapple Field.

We ask how orange trees are raised. The owner of one of the groves tells us that it takes from five to ten years after planting for an orange tree to come into bearing. He says there are trees which have been known to produce fruit when they were more than one hundred years old.

The orange crop is a very important one. It is estimated that more than six hundred million oranges are

eaten in the United States every year. Some of these are imported from Sicily, an island in the Mediterranean Sea; but our best oranges come from Florida, and from southern California, on the other side of our country.

In southern Florida there are fields of pineapples and cocoanut groves. The cocoanut trees are a species of the palm. They begin to bear at from nine to twelve years of age, and a good tree will have at one time as many as one hundred and fifty cocoanuts on it. The pineapples grow on the ground, not unlike cabbages. They are cultivated, and, like the oranges, are much more delicious when eaten fresh.

The most of southern Florida, however, is very wild. You can ride for hundreds of miles in boats through the swamps, and you will find there bears, wildcats, and deer. If you take a swim in the water you must look out for alligators, and one is hardly safe in some parts of the Everglades without a gun in his hand.

XVII. THROUGH THE MISSISSIPPI JETTIES TO NEW ORLEANS.

IT is at Tampa, on the west coast of Florida, that we get a ship which will take us across the Gulf of Mexico to the mouth of the Mississippi River. The Gulf of Mexico does not look very large on the map, but its eastern and western shores are farther apart in places than New York and Chicago. Our best route by water will be to go first to Mobile, the chief seaport of Alabama, and thence by a short ride to the mouth of the Mississippi and up to New Orleans.

We enter the Mississippi River through that one of its mouths known as the South Pass. The Mississippi has a number of mouths through which it flows into the Gulf of Mexico. The lands in this part of our country have been built up during the ages by the mud or silt carried down by the Mississippi from the uplands. The waters of the Mississippi are loaded with mud. They color the clear waters of the Gulf of Mexico far out from the mouth of the river. They bring enough dirt into the gulf every year, it is said, to make an island a mile square and half as high as the Washington Monument.

You would think so much mud would stop up the river. So it would were the current not strong enough to carry it out into the gulf. As it is, so much mud has been dropped into the bottom of the gulf, not far from the mouth of the river, that great bars have been built up, over which large ships cannot easily pass.

Our ship, however, crosses one of these bars by sailing through a channel formed by what are known as the Mississippi River jetties. These jetties are river walls, which have been made in a curious way. They were planned and constructed by Captain James B. Eads, in order that ships might go from the gulf through the bars into the deep waters of the river, and thus reach New Orleans and the other cities upon its banks. Captain Eads saw that the gulf was much deeper a little farther out from the bars, and he believed that if he could make walls, or jetties, on both sides of the channel, so that the water would have to pass between them without spreading out, it would flow so much faster that it would carry the mud with it far out into the gulf. He thought that the stream would at the same time wash out the mud in the channel where it crossed the bars. He laid his plan before Congress, and

was given the money to carry it out. It was found to be a success. The river flows through with great force, and now there is a channel, several hundred feet wide and thirty feet deep, through which ships can go from the Gulf of Mexico into the river.

But how were the jetties made?

It must be very difficult to build walls in the sea. First many rows of great tree trunks, or piles, were driven into the bed of the gulf on both sides of the channel, so that there were wide lines of piles running out from the end of the land through the water, over the bars, and on into the gulf. Some of the piles were driven thirty feet down into the bottom of the gulf in order that they might be very strong.

But the trees alone would not have kept back the water. No; it would be as easy to stop a brook by holding your hand down into it and spreading out your fingers as to keep back the Mississippi by tree trunks. Very solid and closely built walls were needed. These could not be made with mortar or stone, for there was no way to keep back the water while the masons were working.

How do you think they did it?

They made the river help build its own wall. First they cut millions of willow twigs and limbs, and tied them together into great rafts. They floated these rafts in among the piles, and then loaded them with heavy stones and gravel until they sank down to the bottom. Then they floated other rafts just over these, and sank them in the same way, until at last there were walls of willow and stone on each side of the channel, from the land's end far out into the Gulf of Mexico.

The walls were not yet tight; but they were soon made tight by the water. The water from the Mississippi

River, as it flowed through the willow and rocks, left enough mud to fill the spaces between them, and now there is a wall several miles long on each side of the channel. The water rushes through the channel with such force that it carries its mud far out into the deep waters of the gulf, so that it does not affect travel where it falls to the bottom.

Canal Street, New Orleans.

New Orleans is mostly on the left bank of the river, about a hundred miles from the gulf. We pass many ships as we sail from the gulf, and the vessels increase in number as we near New Orleans. This city is the chief seaport of the great Mississippi Valley. As we approach it we pass ships piled high with cotton bales, steamers loaded with barrels of sugar, and ships full of grain to be carried to Europe. New Orleans is fast becoming one of our

great grain ports, and vast quantities of grain are shipped from here every year to the markets of Europe.

From our ship we can see for miles over the country. In some places the land is lower than the surface of the river, and levees, or high banks, have been built up to keep back the waters. This is the case with parts of New

A Cemetery, New Orleans.

Orleans. There is, indeed, no place in the city where you can dig for more than a few feet without striking water, and for this reason New Orleans cannot have cisterns or cellars. In many of the cemeteries the graves are above ground, and we visit some where the coffins are laid away in vaults, resting one on top of the other, as though in a great file of pigeonholes.

We find New Orleans very interesting. It is more like a European city than any other city of the United States. New Orleans first belonged to the French. A little later Spain owned a large part of our country northwest of the Gulf of Mexico, and New Orleans was then one of the chief Spanish towns in the New World. Then this territory again came into the possession of France, and in 1803 it was sold by the French to the United States. You may have read of the sale in your history as the "Louisiana purchase." By this purchase we got some of the most valuable of our lands, including the town of New Orleans.

A Street Scene.

This town has now grown to be a large city. It has three hundred thousand people, but it still shows the marks of the foreigners who founded it. It has long streets of old houses with tiled roofs, something like the buildings you see in pictures of the cities of Italy or southern France. There are wide porches, or galleries, built out over the streets from the second stories of the houses, so that you can walk for blocks without getting in the rain or sun, except at the crossings of the streets. The finest business parts of the city along Canal Street make one think of the Boulevards of Paris.

In some parts of New Orleans there is as much Spanish or French spoken as English. Suppose we visit the French market. This is one of the largest in the city. It is not far from Canal Street, and we can easily walk to it from our hotel. We find that many of the marketmen are French, Spanish, and Italian, and those who are buying use what to us seems a strange jargon in making their bargains. There are some Americans, but the faces of the most of them show that they are of foreign descent. At some of the stalls vegetables are sold by the lot, and not by the bushel, peck, or quart. They are arranged in piles on tables, and each marketman fixes the sizes and prices of his own piles. The buyers look at the piles and take those which they think are the biggest and best.

But let us walk down to the wharves, and see how the cotton is handled. This is the greatest cotton-shipping port of the world, and millions of dollars' worth of cotton is sent from here to Europe every year. The cotton is brought in by boat and by rail from the plantations of the Mississippi and Gulf states. It is first hauled to cotton compresses and squeezed into smaller bundles, so that it may not require so much room on the steamers which take it to New England or to Europe.

As we get nearer the wharves we see large drays loaded with cotton. They are pulled by mules driven by negroes, who sit high up in the air on top of the bales. Let us follow one of them, and see how the pressing is done.

The wagon goes through the narrow streets not far from the banks of the river. Here there are many low buildings surrounding large yards, which can only be entered through iron doors. These are known as cotton yards. We enter, and see that the buildings are immense sheds filled with cotton bales. The yards are also filled with

cotton, and the pavements outside are so piled up with cotton bales that we find it hard to get through.

As we look, a dray loaded with cotton comes in through the doors. The bales are rolled off and weighed. Then they are wheeled on low trucks to another part of the yard, where the great pressing machines are at work.

As the bales are brought in, each takes up about as much space as the ordinary kitchen table. It is as high as your shoulder and about four feet square. It has al-

On the Wharves at New Orleans.

ready been squeezed by the machinery of the plantations into as small a package as was possible outside the great cotton press.

Let us go over there, and see how the pressing is done. The man who wheels the bale to the press has already cut the iron hoops with which it is bound, and as he does

so the cotton swells out as though to take a breath of relief. It swells more and more as it is thrown into the press, not seeming to realize that the great jaws of iron above and below it will crush it harder than ever.

Near the press there is a steam engine, and, as we look, the engineer pulls a lever, and the two heavy steel jaws move toward each other. The bale of cotton seems to groan as the jaws squeeze it tighter and tighter until at last it is not as high as your knee. It has been pressed from a thickness of four feet down to about one foot; and as it lies there thus squeezed, the iron hoops are again bound about it. It swells out a little, trying in vain to burst its iron bands as the monster machine lets go. Then it is pulled out and rolled upon another dray, which is waiting to carry it off to its dark prison in the hold of the steamer. Such pressing costs but a small sum per bale, and it more than pays for itself in the increased number of bales that a ship can carry.

XVIII. A VISIT TO A SUGAR PLANTATION.

HAVE you a sweet tooth?

If so, you must be careful in your travels with us to-day. New Orleans is one of the chief sugar markets of the United States. There are thousands of barrels of sugar piled up on the wharves, and there are streets of the city in which so much sugar is kept or refined that we smell nothing but sugar and molasses as we walk through them.

We are now in the land of sugar. There are vast plantations in this part of the country where sugar cane is

cultivated, and we can here learn how some of our sugar is made. We saw how maple sugar is produced in Vermont by boiling down the sap of the maple tree. A great deal of sugar is now made from beets in the western part

A Sugar Plantation.

of our country, and another large portion comes from these cane plantations on the rich, moist soil of the lands about the Gulf of Mexico. We do not, however, produce nearly all the sugar we use. We get much beet sugar from Germany, and cane sugar by the shipload is brought to us from the West Indies, the Hawaiian Islands, and Brazil.

There are scores of sugar plantations within a few hours' ride of New Orleans, some of which contain thousands of acres. The plantation we shall visit to-day is so large that a railroad has been built upon it in order that the sugar cane may be quickly brought from the fields to the factory. There are so many people employed upon the plantation

that their houses would make quite a large village, and the buildings of its refinery cover several acres.

We must take a railroad train to visit this plantation. The cars from New Orleans carry us for miles through fields of sugar cane. Now and then we see the smoke of a huge sugar factory streaming out against the blue sky. We pass through swamps, the trees of which are loaded down with Spanish moss, and at last stop at the station which was especially made to accommodate the workmen of this sugar estate.

We first take horses for a gallop across the plantation. There are roads through the fields, and we ride for miles between walls of green cane. The leaves of the cane rise above our heads as we sit on our horses.

Cutting the Cane.

Have you ever seen a field of corn when it is ready for cutting?

Such a field looks much like a section of a sugar plantation when the cane is ripe. The sugar cane, however, is much higher than the corn, and its stalk has several broad leaves where the corn's stalk has one. Many of the sugar-cane stalks are fifteen feet high, and they are planted so close together that it would be almost impossible for a man to make his way through them.

But before we go on, let us stop and learn how sugar cane is grown. The planting is done either in the fall or in the spring, but the process is not like corn-planting. The cane used for sugar does not grow from the seed.

The cane stalks when ripe are cut off, and laid flat in furrows which run from one side of the field to the other. The furrows are seven feet apart. The stalks of cane are laid down so that they fit close together, three being placed side by side, making three long rows or pipes of cane in each furrow. Next the soil is thrown over the cane with a plow. In the spring sprouts start up from each joint of the cane, making long ribbons of green, as it were, against the black field. These sprouts grow very rapidly. In August they have become as tall as a man, and they grow on until the middle of October, when they are about twice as high as the average corn stalk and are ready for cutting. This is the size of the cane on the plantation during our visit.

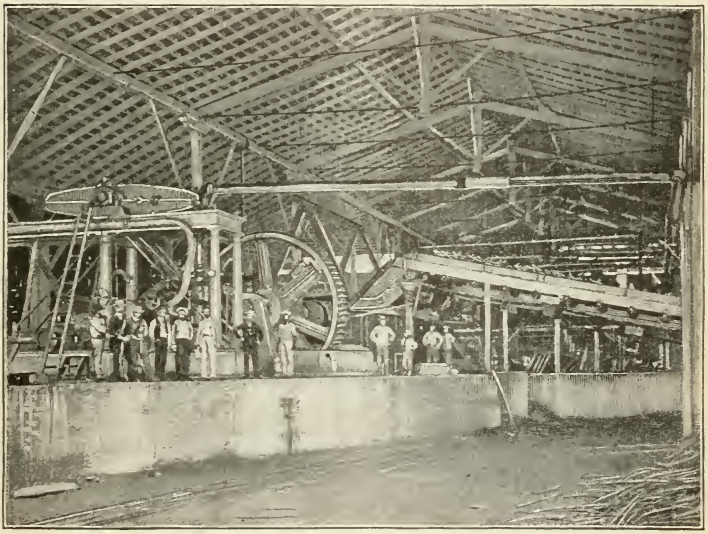
We stop for a while at one end of the great sugar farm, where scores of men and women are cutting cane. They labor in squads, under an overseer. As the cutters stand in the fields they face what looks like a solid wall of green cane. Each cutter has a knife, which flashes in the sunlight as he cuts his way through the wall.

See how carefully and how quickly they work! They seem to know just how many strokes to use, so that not a motion is wasted. The richest of the juice is found near the bottom of the stalk, and for that reason they cut the stalks off very close to the ground. The tops and leaves are worth little for sugar, and so they strip each stalk of its leaves and cut off its top before they go on to the next. The stalks, when cut, are thrown into piles or windrows to be ready for the carts which gather them up for the cars.

There is a train now ready to move. Let us jump on and go with it, and see something of the work which it takes to produce a spoonful of sugar.

As we ride to the factory we pass large canals, and are

told that this plantation was at one time a swamp, and that the sugar lands usually have to be drained before the cane can be planted. We have seen the work that it takes to grow the cane, and we are now approaching a group of large buildings which are filled with wonderful machinery for getting the juice out of the stalks and turning it into sugar.



Interior of Sugar Mill.

Our car stops at the buildings. The cane is thrown off upon a moving belt or roadway, which carries it up to the top of the big sugar mill, and drops it down upon two heavy iron rollers, which have teeth much like those of an enormous file. The rollers themselves are as big around as a hogshead and are very much longer. They are of steel, and are so arranged that a great weight can be added to them by machinery. As each stalk falls between

the rollers, the teeth catch hold of it and pull it in. The enormous weight squeezes the juice out of it, and it passes off on a moving belt at the end of the machine, crushed to a pith, and as dry as a last year's corn stalk. It is so dry that it burns easily, and the moving belt throws it into the top of the furnace, where it forms the fuel to make the steam which is to squeeze the juice out of the stalks yet to come.

But what becomes of the juice? Come down under the rollers and see. It is pouring down in streams from the lower part of the rollers into a trough about a foot wide. Dip in your finger and taste the liquid as it falls from the cane. It is so sweet that it is almost sickening. The fluid looks dirty, and it reminds you of dishwater. Still, out of that sweet, dirty water the pure white sugar must come. Every bit of dirt must, however, be first taken out of it, for it must be as clear as crystal before it can be boiled down into sugar.

The water is first bleached by putting it into large iron tanks and running sulphur gas through it. The gas makes the juice bubble, and the yellow foam which rises to the top is skimmed off. Lime is now put into the tank to settle the dirt, and after several such processes the water becomes almost perfectly clear.

It is now ready for boiling. This is done in huge copper kettles or vats, which are heated by coils of steam pipe. As the liquid boils, it is skimmed. It flows from one tank to another, growing clearer and clearer, and thicker and thicker. Taste it now. It is the purest of sirup, and its color has turned a light yellow.

Look at the sirup as it seethes in the tank! What an enormous amount there is of it! Let us follow it along the pipes through which it is emptied into the immense

vats on the floor overhead. There is enough sirup here to give a whole state a taffy-pulling. There at the left is one big barrel which contains forty thousand pounds of sirup, which is boiling and seething in the process of being turned into sugar.

Come with me now to that great vat, and see the half-sugared molasses which fills it. This vat is twice as long as your parlor at home, and so deep that if you fell into it

Where the Sugar Cane Grows.

you would be drowned in the sweet mixture. Take up a spoonful of the stuff. It is as thick as mush, and it is in fact a mush of sugar and molasses.

It needs now only the drying machine to take out the sugar; this separates the molasses from the sugar; and we step into a room at the side, where the sugar goes after it leaves the machine.

It comes into the room from the top, falling in an end-

less stream of white sugar down from the ceiling. There are men who are shoveling it away as it falls. They are putting it into the barrels in which it is to be shipped to the markets.

The coarser sugars are not so carefully cleaned, but much of the fine sugar we have on our tables is made in this way.

What becomes of the molasses? Molasses, as the word is used in a sugar refinery, is the refuse which is left in the making of sugar. It contains the poorest parts of the juice after all the sugar possible has been made from it. Such molasses is different from what the sugar makers call sirup, which is made from the fine juice of the cane. The refuse molasses is indeed very cheap; it is sometimes sold as low as one cent a gallon. When it is as cheap as this it does not pay to put it in barrels, for the barrels would be worth more than the molasses; and so it is carried to the markets in tank cars, and is sold largely in bulk.

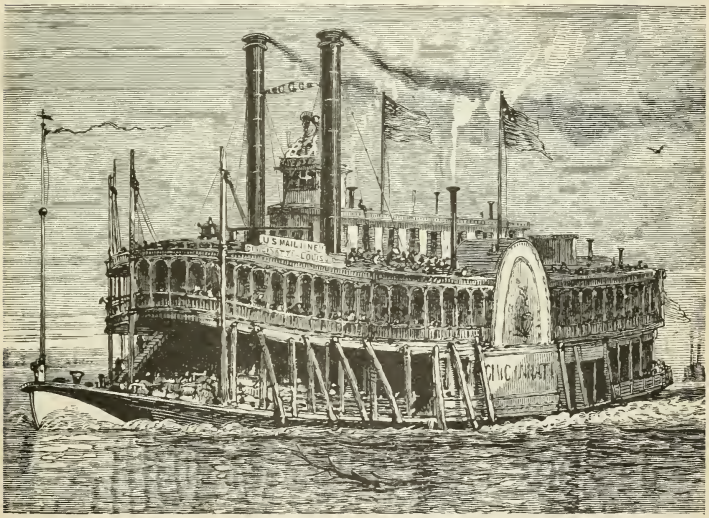
XIX. UP THE MISSISSIPPI RIVER TO ST. LOUIS.

WE leave New Orleans on a steamer this morning for a tour through the Mississippi Valley. This valley contains more than one third of all the land of the United States. It has more rich soil in one body than can be found in any other part of the world. Almost all of the basin of the Mississippi is good land. It lies in the temperate zone, and is said to be one of the best dwelling places on the globe for civilized man.

The Mississippi, including the Missouri, is the longest river in the world, and, with its branches, it forms one of

the most wonderful river systems of the globe. You might cross the Atlantic Ocean from New York to Liverpool three times, and not sail as far as you can sail upon the Mississippi system.

As you see this system on the map, it seems like a huge tree, with its roots in the Gulf of Mexico, and its mighty branches spreading out over the richest lands of the United



A Mississippi Steamboat.

States. It is the great water highway of the central part of our country, and an almost endless procession of boats and ships is always moving up and down its trunk and through its various branches. We pass scores of ships as we leave New Orleans.

Our steamer makes us think of a floating house of three stories. The lower stories are filled with freight; the top

story is our sleeping and eating place; and the hurricane deck is the yard upon which we walk and watch the banks on both sides. We are moved through the muddy waters

A Cypress Swamp.

by the great paddle wheels at the sides of the boat, which its immense steam engines keep going day and night.

How green and beautiful everything is!

We sail at times through forests of cypress trees, loaded down with Spanish moss. The trees are so bound together with grapevines and dense vegetation that they form green walls on each side of the wide, muddy river; and the only living things we see are the birds which hop from branch to branch, and now and then a few people at the clearings, where little farms have been cut out of the trees.

Now the Mississippi widens, and we seem to be traveling through a series of lakes. We pass swamps and float by fields of sugar cane and cotton.

Now and then we stop at a little village on the banks; and farther up the river, at the city of Natchez, we take on packages of goods, bales of cotton, and hogsheads of tobacco. Rough-looking men and boys, the most of whom are colored, load and unload the steamers. They sing as they work, making a great noise as they roll the huge bales down the gang plank.

At Vicksburg we stop for more cargo. Here there are immense elevators on the banks of the river, and bales of cotton, barrels of flour, and bags of grain are rolled down into the boat. All kinds of things are brought to the steamer. We see hundreds of crates of chickens taken on board to be carried to market. Each crate is just high enough for the chickens to stand up inside it. They poke their heads out of the slats on the top, and squawk complainingly at us, as the men carry them upon the boat.

All the way to Memphis we pass steamers going down to New Orleans, loaded with cotton. Memphis is one of the most important cities below the mouth of the Ohio. There are so many boats at its wharves that they make us think of a seaport. There are steamers ready to sail up the Arkansas and White rivers, and in the busy season you can go by steamer every day from Memphis to St. Louis.

How the Mississippi winds in and out as it flows on its course! From Cairo to New Orleans it is like an enormous snake, only more crooked than any snake could possibly be. Mark Twain, who was once a Mississippi pilot, said that if you should peel an apple so that the whole skin would be in one single peeling, and should throw it over your shoul-

der, the way it would look as it fell on the floor would be much like the lower part of the Mississippi River. As our steamer winds through the curves, we see other boats sailing to the right and left along the winding current above and below us; and there are places where we can get off upon the land, and walk across the fields a half-mile or so, and there wait for the steamer, which may have to go a dozen miles around to reach the same point.

All along the river, for hundreds of miles after we leave New Orleans, we notice that banks, or levees, have been built up on each side of the stream to keep the water from running over the land. There are eighteen hundred miles

A Levee.

of such levees, on one side of the river or the other. It has cost many millions of dollars to build them, and every year Congress sets aside a large sum to improve the navigation of the Mississippi.

And are the levees strong enough to protect the people from floods?

Yes; sometimes, but not always. The Mississippi River is very hard to control. It is always changing its course,

Flood Caused by a Break in a Levee.

always wearing off the land in some places and piling it up in others. It seems to be always looking for a place where it can break through its banks. The least crack is soon enlarged by the water flowing through it, and if it is not stopped at once the river will pour out over the land.

The moment a break is discovered the people rush to fill it. They drive down stakes into the water where the crack is, and put bags of earth between them. They take boats, and throw all kinds of stuff into the break, in order to stop the stream before it can make the hole larger. If the break should become ten feet wide it is almost useless

to try to keep back the waters. They dissolve the bank as though it were sugar; they cut off the dirt like a knife; and when the break has reached a width of a hundred feet the banks drop down into the water in slices half an acre in thickness, and the muddy river rushes with a loud noise over the country.

At such times farms are often swallowed up; islands are made in the stream, and thousands of acres of land are covered with water. The animals, when they see the water coming, run to the highest places; but there are not many hills in the lower Mississippi region, and the cattle, horses, and sheep often starve before the water subsides or the people can come in boats to take them away. The Mississippi floods often tear down houses, and you may sometimes see buildings, with families on the roofs, floating down the river. The woodpiles on the banks are carried away, and thousands of cords of wood float upon the waters, while large trees that have been torn up by the roots are rapidly borne along by the current.

On our voyage up the river we are stopped again and again by the ships and barges coming down. The traffic is enormous. We pass long rafts of lumber from the Red River. There are logs from the upper Mississippi, and rafts of boards, with little houses built upon them, in which the lumbermen live during the voyage.

There are huge barges, or flatboats, loaded with grain, fastened together in blocks, and pushed by steamboats behind them. There are steamships pushing barges filled with corn, and we learn that millions of bushels of corn and wheat are thus taken down to New Orleans every year.

Freight can be carried much more cheaply upon water than upon land. The rates are so low from St. Louis to New Orleans that as much grain as two horses could haul

is carried at the rate of a cent for every five miles, and it costs less than six cents to take a bushel of wheat from St. Louis to New Orleans, although the distance between the two cities is more than twelve hundred miles. Coal is carried upon the rivers even more cheaply. It costs so little to carry it that people in New Orleans use coal from the mines of Pennsylvania, although the mines there are as far away as Maine is distant from Ireland.

But why does it cost so little to carry heavy things on the water?

We can easily see as we look at the big loads going by us, pushed by small steamers. A little steamboat on the Mississippi can do more work than one several times as large on the Atlantic Ocean. This is because the storms do not affect the river as they do the ocean. There are no heavy seas to sail through. The water is so quiet that large water-tight boxes or barges can be used to carry goods; and as there are no waves to contend with, one little steamer can push many of these barges down the river.

There comes a steamer now, with a lot of barges filled with coal in front of it. Notice how it puffs as it forces them onward. The barges are fastened together, two moving along side by side. Each barge is as long as a city lot and almost as wide. It is as deep as the ceiling of a room is high from the floor, and if you will imagine an ordinary-sized schoolroom packed full of coal, you will have some idea of the amount of coal it is carrying down to New Orleans.

We are almost stopped by these barges as we approach the city of Cairo. They have come through the Ohio River from the coal fields of West Virginia, Pennsylvania, and Ohio, the most of them having been loaded at Pittsburg. The Ohio River may indeed be called the coal

chute for the cities of the Mississippi Valley. A line of barges floats down it, carrying millions of tons of coal to the cities along its banks, furnishing the fuel which makes the steam for the factories of Cincinnati, Louisville, and St. Louis.

Leaving Cairo, we find the river much straighter than it was farther south. We sail through a rich farming country, and soon approach the city of St. Louis, Missouri. St. Louis is the most important of the Mississippi River cities. It is one of our chief commercial and manufacturing centers, being the fourth in size among the cities of the United States.

Union Depot, St. Louis.

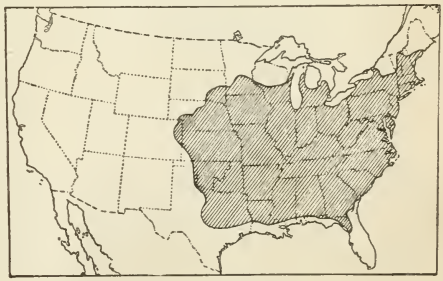
It is its situation that makes St. Louis such an important place. It is on the great Mississippi River, between the mouths of the Missouri and the Ohio, and only a few miles from the mouth of the Illinois River, so that goods can be easily shipped up and down the Mississippi and through all the branches of its system. This makes it the gateway to the southwestern part of our country, and many of the goods that are shipped to Mexico go through

St. Louis. It is a great railroad center, and a vast number of trains are always speeding to and from it, carrying all kinds of freight. During our stay we look at the huge bridge across the Mississippi, and then visit the Union Depot, which is one of the largest and finest depots in the world. The cars all back into it, so that the engines are left outside, keeping the smoke out of the depot.

We find St. Louis a beautiful city. It has wide, well-paved streets and many magnificent buildings. It has more parks than any other city in our country, and we enjoy our rides through the residence portion, the houses of which have beautiful yards.

XX. INDIAN CORN AND THE CORN BELT.

AS we sail on our way up the Mississippi north from St. Louis, we pass through vast tracts of corn. For hundreds of miles the banks on both sides of us are lined with cornfields, and we might travel on the railroad for hours on fast express trains, east and west, without coming to the end of the fields. We are now in the heart of the great corn patch of the United States, and we decide to stop off and spend some time surrounded by this wonderful crop.



The Corn Region.

In our railroad rides we find that the corn grows so well here that in some places it reaches above the car windows, and we are whirled along between walls of green stalks, the wide leaves of which rustle in the wind made by the train as it carries you through them. Now the railroad track runs along upon an embankment. We are above the fields, and we look over a sea of green leaves, spotted with the golden tassels which form the ends of the stalks. Some of the leaves have turned to gold, the green stalks are streaked with yellow, and the fat ears have husks of a lemon hue.

Husking Corn.

The corn crop is now ready for harvest. The stalks are being cut and shocked, and later on the ears will be torn from their husks and carried to the markets.

Pull off one of those ears of corn and look at it. You have before you one of the most wonderful of grains. It is a grain which more than any other belongs to our continent, for it was not known in Europe before America was discovered.

Take one of the kernels and bite it open. How hard it is, and how white its inside looks! If you should put it under the microscope, you would find that its flesh is composed of hundreds of little boxes, containing scores of cells, so that there are thousands of cells in a single grain.

Each of the cells contains starch and other matter good to eat, and corn is one of the best of foods for both man and beast.

Do you realize how much our corn crop is worth to us? It is by far the most valuable thing we raise. We get more from our cornfields every year than we do from all our gold, silver, and lead mines. Our corn crop is worth more than twice as much as our wheat crop. We produce so much of it that it is almost impossible to realize how great the amount is. We raise more than two billion bushels of shelled corn every year. The figures are too big for us to understand them, and we shall consider first only the corn grown in the region where we are traveling. Corn is raised in nearly every part of the United States, but more than half of our crop comes from the seven great states of Illinois, Indiana, and Ohio, to the right of us, and Missouri, Kansas, Iowa, and Nebraska, on our left, as we go up the river. This is the greatest corn patch on the globe. It produces more than one billion bushels of corn every year, or more than one half of our crop.

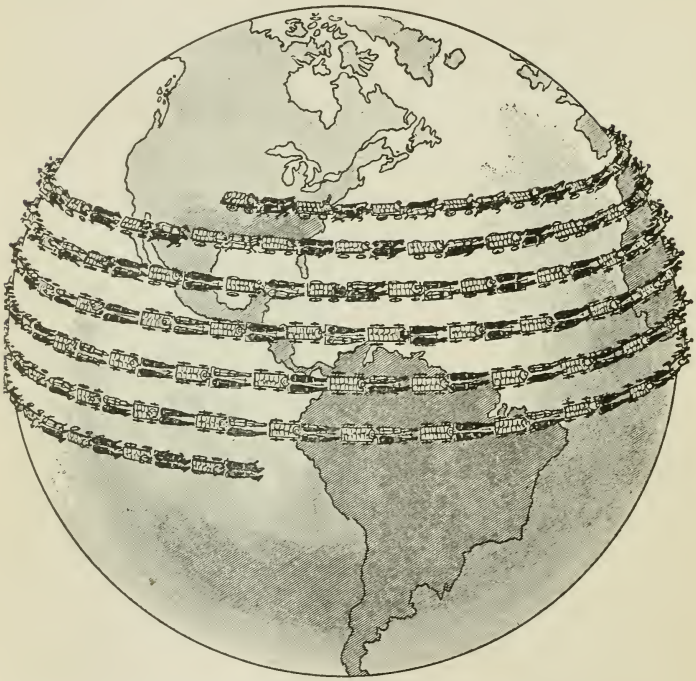
Now let us think for a moment how much corn one billion bushels is. Suppose we load it upon wagons. Forty bushels of shelled corn forms a good load for two horses. Let each wagon hold that amount, and let the teams start at the Mississippi River and go eastward. We shall drive the teams so that the nose of each horse will just reach the tailboard of the wagon in front of it, making a continuous train of wagons, each loaded with forty bushels of corn. Now where would the first wagon be when the last bushel was loaded? At Pittsburg, on the edge of the Alleghany Mountains?

No; it would be much farther eastward.

At the Atlantic Ocean?

No; still farther eastward. Suppose that the wagons could be driven across the oceans, and guess again.

It might perhaps reach almost to Paris, do I hear some one say?



We should have to make six such lines around the world."

Yes; it would reach, on and on, much farther than that. The line of wagons would extend from the Mississippi over our own country to the Atlantic Ocean, across the Atlantic to Europe, across Europe and over the highlands of Asia, and then across the wide Pacific Ocean. It would not stop there, but would climb over the plateaus and

peaks of the Rocky Mountains, and come back to you at the Mississippi River, making a solid belt of corn wagons clear round the world.

But stop! we have not yet loaded all of the corn crop of these seven states. The pile seems almost as big as when we began. There are five times as much corn left as that we have put on the wagons, and we should have to make six such lines around the world before we could load a single year's crop of this great corn patch. It would take so many wagons, indeed, that if they were stretched out in one single file, the first wagon would be more than one hundred and fifty thousand miles away before the last wagon was loaded. And yet these seven states contain only about one half of the corn we produce, and you must multiply the number of wagons by two if you wish to know how many would be needed to carry one year's corn crop of the whole United States.

But what becomes of all this corn?

The most of it is used in this country. Not one bushel in twenty is shipped off to Europe. We can find where much of it goes by visiting the barnyards of the United States. We see the farmers throwing it out to the stock. We have so many cattle and hogs in our country that if we could drive them in single file they would form two lines long enough to guard our wagon train of corn as it is stretched round the globe. In such a march the noisiest animals would be the hogs. There would be more than forty millions of them, grunting and squealing as they followed the wagons. Corn is the chief food of hogs. By feeding it to them the farmer turns his corn into pork, thus making the hogs manufacture the corn into an article that can be easily sold.

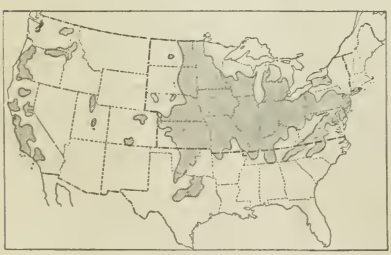
The people of Europe will not buy much corn, but they

are glad to get our meat; and so, through this corn belt where we are traveling, we shall find vast establishments devoted to the killing of hogs and preparing their meat for sale. These are known as packing houses. We may visit them at Omaha, Kansas City, and St. Louis. Here hundreds of thousands of hogs are killed every year, and from here their meat is shipped to all parts of the world.

XXI. A VISIT TO A GREAT WHEAT FARM.

NORTH and west of the upper Mississippi is a region which might be called the "Bread Basket of North America." Here, in both Canada and the United States, are some of the best wheat lands of the world.

Wheat is one of the most important grains known to man. It has been used for ages by the peoples of the Old World. Egypt in the time of the Pharaohs was a great wheat land, and there are pictures on the walls of some of the Egyptian tombs showing how wheat was raised there in those ancient days. Wheat is now grown in many parts of the world. Great quantities of it are produced in India, France, and Russia, and there are vast wheat lands in Australia and in the valley of La Plata River in South America.



The Wheat Region.

Although wheat was not known in this hemisphere

before Columbus came, our continent now produces more wheat than any of the other grand divisions of the globe. The United States grows more wheat than any other country. The people of Europe, to a large extent, eat flour made from our wheat. We send millions of bushels of this grain every year across the Atlantic, and, with the single exception of cotton, we get more for our wheat from foreign countries than for any other crop.

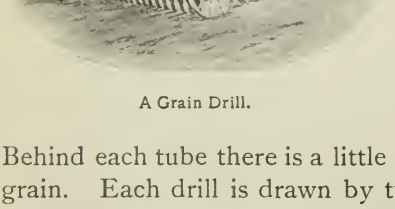
Wheat is grown in nearly all parts of the United States, but our best wheat lands are those which lie north of the Ohio and Missouri rivers. In Minnesota and in the Dakotas there is a region known as the Red River Valley. The wheat farms there are of vast extent, and they are managed on a grand scale. Each big farm has its own bookkeeper and its overseers. It employs hundreds of men, and it purchases its machinery and supplies by the carload, at wholesale rates. On one wheat farm in North Dakota there are two hundred and fifty pairs of work horses and mules, two hundred plows, a hundred and fifteen harvesting machines, and twenty thrashing machines run by steam. When the grain is ripe, four hundred men are employed to harvest it, and at the time of thrashing there are six hundred at work.

A Sulky Plow.

But suppose we visit a big Dakota wheat farm. The

farm comprises thousands of acres, and in going over it we ride all day on horseback. Some of the fields contain as much as five hundred acres each. The men working in them labor in companies, under mounted overseers, who gallop from one company to another to see that everything is properly done. In plowing the ground, sometimes a score of sulky plows, driven by men who sit on the plows, will move across the field together. They will plow several acres of ground at a single trip, and thus riding over the prairie turn under the tough sod.

The ground is harrowed in much the same way, and the wheat is drilled in by seeders, or grain drills. These drills are long boxes mounted upon wheels. Each box is filled with wheat. From its bottom running down to the ground are slender tubes about as big around as the end of a broomstick. Down these tubes the grains of wheat run just fast enough to thoroughly seed the ground. Behind each tube there is a little plow, which covers up the grain. Each drill is drawn by two, three, or four horses, and a long line of them will plant a vast tract of wheat in a very short time.



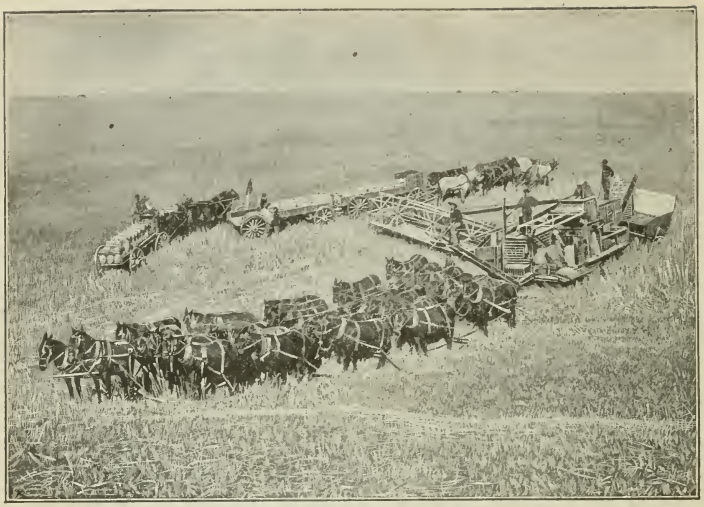
A Grain Drill.

But let us suppose that our visit to this region is made when the wheat is ready for harvest. This time is later than harvest time in the warmer wheat lands farther south. Harvesting on these big farms is a wonderful sight. The wheat is cut by long lines of reaping machines, or harvesters, pulled by horses or mules. The din of the machinery

makes us think of a boiler factory. We can hardly hear the voices of the drivers as they yell at their teams.

As we draw nearer, we see that the most of the noise comes from the knives which are moving very rapidly back and forth a few inches above the ground, and cutting the stalks of grain so that they fall back upon the machine. There is a great reel which pushes the stalks and makes them fall with their heads all the same way. The reaper is so made that these stalks are rolled together in a bundle, and, when the bundle is just large enough, binds a band of wire or string about it, and throws it off the machine in sheaves. Behind the machines men walk, and pick up the bundles and stand them on end in shocks, that the wheat may become thoroughly dry before it is thrashed.

Thrashing on one of these farms is far different from thrashing in other parts of the world. In some of the wheatfields of Europe the grains are still pounded out of the straw with a club. In China I have seen boys riding oxen over the straw, as it lay on the hard ground of the thrashing floor, in order that the feet of the animals might tread out the grain. In the Red River Valley the most of the work is done by steam engines which move the wheels of the thrashing machines. Each thrasher will hull out more than one thousand bushels of wheat in a day, thus doing the work of hundreds of oxen or thousands of clubs or flails. Our thrashers separate the grain from the chaff and straw, and the clean wheat flows out through a wooden pipe at the side so fast that it keeps two men busy holding bags in order that all the grain may be caught. On some very large farms the work of cutting and thrashing is done at the same time by a combined harvester and thrasher. Some of these great machines are drawn by steam engines; others by teams of from twenty-five to



Combined Harvester and Thrasher.

thirty horses and mules. A single machine with four men will gather and thrash from seventeen hundred to three thousand bushels of wheat in a day.

But how is the wheat cared for after it leaves the fields?

This is almost as great a business as raising the wheat. At some of the railroad stations in the wheat regions, and at all the large grain ports of the United States, there are huge elevators, or granaries, used for storing grain until it is wanted for sale.

There are such granaries at New York and New Orleans, and at all the large cities upon the Great Lakes. We find many of them at Minneapolis, and learn that single elevators often have storage room for more than a million bushels of grain. The elevators at Minneapolis alone can hold almost thirty million bushels at one time, and many

million bushels of wheat come into the Minneapolis markets in a single year.

Elevators are usually built by the sides of the railroad tracks, and the wheat is taken from the cars directly into them. Each elevator contains great bins, some of which are as high as a six-story house. Some of the bins will

Elevators — Chicago.

hold thousands of bushels of wheat. The grain is moved to the upper parts of the elevator in little buckets of tin or zinc, fastened to a belt, like those which raise the flour in a mill. At the top of the elevator the wheat is weighed; then it is poured into the deep bins. When it is taken out it flows through pipes into the cars or the ships which are to carry it to the markets.

There are elevators of this kind at the ports at the head of Lake Superior, into which the grain is taken from the cars, and later on poured into the steamers which are to take it down the Great Lakes to Buffalo, whence it is carried through the Erie Canal to New York, to be shipped to Europe. Some grain is loaded on boats and barges and shipped down the Mississippi River; but the greater part goes by the lakes, as this route is the shortest way to the markets of the East.

We find Minneapolis a magnificent city of more than a quarter of a million inhabitants. It is situated on the Mis-

Falls of St. Anthony.

sissippi, at the Falls of St. Anthony. These falls furnish a water power as great as could be given by forty thou-

sand horses all pulling at once, and their situation so near our wheat lands has made Minneapolis one of the chief milling centers of the world. There are numbers of big flour mills here which are grinding away day and night. They grind millions of barrels of flour every year, one single mill grinding as much as twenty thousand barrels of flour in a day.

The mighty Mississippi does other work here in addition to grinding wheat. Its water power runs all kinds of factories. Great woolen mills are operated by it. It saws vast quantities of lumber, and moves the other machinery which makes Minneapolis the manufacturing center of this part of our country.

Very close to Minneapolis is the big city of St. Paul, which is also a thriving commercial and manufacturing center. The two towns are called the "Twin Cities of the Northwest." They contain some of the finest business blocks in our country, and in both of them we may ride for miles through well-paved avenues, lined with beautiful houses. The two cities now almost join, although their business centers are about ten miles apart. We can ride from one to the other in a few minutes on electric or steam railroads, and the day will soon come when there will be at this point one vast city.

The growth of these two cities is due to their situation at the head of navigation of the Mississippi River, at the Falls of St. Anthony, and to their nearness to the head of navigation on the Great Lakes. Goods can thus be sent from them by water down the Mississippi, and also, after a short ride of one hundred and fifty miles on the railroad, down the Great Lakes, whence they may be carried to every part of our country, and to the seaports where they may be shipped to Europe.

XXII. A JOURNEY ON THE GREAT LAKES.

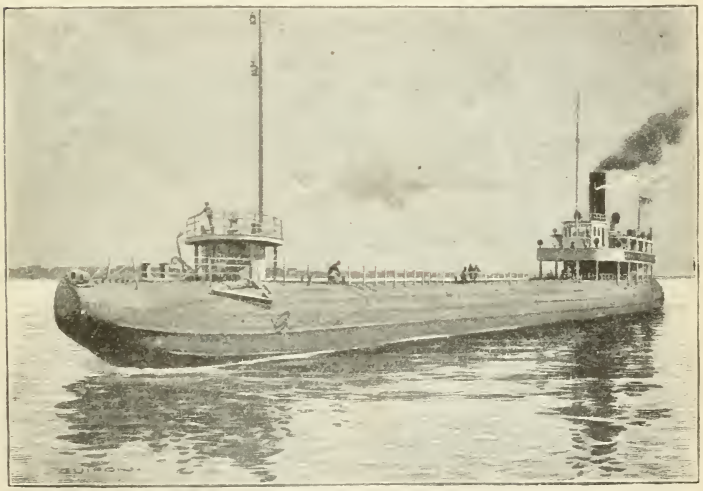
A SHORT railroad ride from St. Paul brings us to Duluth, at the head of Lake Superior. Duluth is built upon the sides of steep and rocky hills about a little harbor. Bowlders of granite jut out of the ground in every city lot, and the houses are founded upon the rocks. The streets rise from the wharves in terraces running backward, so that the lines of houses make us think of the seats of the grand stand in a baseball ground. Not far away, to the right as we face the lake, we can see the immense elevators of Superior city; and as we look at the many vessels in the harbor, we realize that we are at the head of navigation of the Great Lakes.

Look at that steamboat lying under the shadow of a huge wheat elevator at the wharves of Duluth! We have never seen a boat like that before. It is more like an enormous barrel than a steamship, and as it lies there in the water it makes us think of some sea monster or giant whale. Still, the steam is puffing out of the pipes at its prow, and volumes of black smoke are flowing out of its huge smoke-stacks. That is one of the famous whaleback steamships which carry iron ore and grain from Duluth down the Great Lakes. It is now being filled with wheat. We can see the grain pouring into its hold from the pipes which run down into it from the elevator. Thousands of bushels of grain will be thus stored away within a few hours, and the load it will carry will be more than could be hauled by a train of two-horse wagons ten miles in length.

At the same wharf there are other ships which will carry thousands of bushels of wheat at a load; and moving about in the harbor are immense grain barges, which are pulled

by smaller steamers, one little steamboat dragging a long line of bigger boats behind it.

The chain of Great Lakes forms one of the chief commercial highways of the globe. The upper portions of these lakes are frozen during the winter, and for five months they are almost as deserted as the icy seas about the north pole. It is only during the seven warmer months



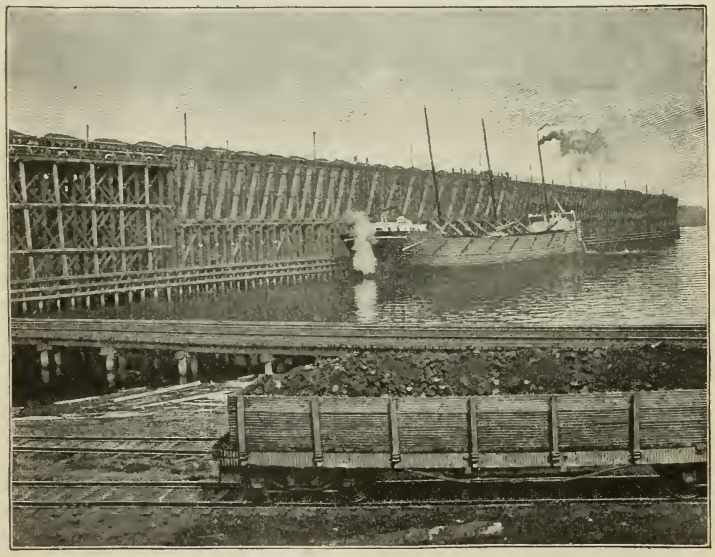
A Whaleback.

that ships can navigate them; but in this time more freight is carried upon them than all that is brought into Liverpool or London in a whole year.

During the summer months, day and night, there moves over this great waterway an almost endless fleet of steel steamships, white-winged sailboats, massive barges, monster whalebacks, and magnificent passenger steamers, carrying thousands of people and millions of tons of freight

to and fro. There are ships which carry nothing but iron ore from the mines about Lake Superior, down to Cleveland, Chicago, and other ports. There are ships loaded with copper from the mines of the Michigan peninsula, and vast rafts of lumber from the pine forests of the upper lakes.

Were it not for these lakes our immense harvests of grain could hardly be taken to the seaboard. That whaleback will steam out with its great load of seventy thousand



Ore Docks at Duluth.

bushels of wheat to Buffalo, or it may even pass through the Welland Canal and go on down through Lake Ontario into the St. Lawrence River, and out across the Atlantic to the seaports of Europe. There is a navigable waterway

from Duluth to the sea, and if the destination of our whale-back is Liverpool, it will have to travel more than half of its voyage in fresh water before it gets to the Atlantic Ocean, at the Strait of Belle Isle.

The journey can be made so cheaply that for a very few cents a bushel of wheat can be taken to Buffalo, and for thirty cents or less a ton of coal can be brought in the same ship back to Duluth. The cost of carrying goods by water in this way is less than half the cost of carrying them on the railroads. It is this cheapness that has caused many towns and cities to spring up at the good harbors along the Great Lakes, and at the channels between them, and it is to these cheap freights that many other cities owe much of their wealth.

But before we go farther, I must tell you a curious thing about this valley or basin in which these vast fresh-water seas lie. It is situated almost on the Height of Land, on the crown of the eastern part of North America, so that over the rim of the basin the ground on the north slopes toward Hudson Bay, and on the south toward the Gulf of Mexico. The rim of the basin of the Great Lakes is not very high, and canals have been cut from Lake Erie south to the Ohio River, so that freight from the Great Lakes in this way goes to the Gulf of Mexico. A canal is also being opened from the lower end of Lake Michigan to the Mississippi River, and the Erie Canal takes vast quantities of freight from Lake Erie at Buffalo across New York to the Hudson River, whence it goes by water to New York city. It is also said that men can sail in canoes up the streams flowing south into Lake Superior, and, by carrying their boats a very short distance, can drop them into streams which flow into Hudson Bay.

Another curious thing about the basin of the Great

Lakes is its shape. It is formed of three great terraces, lying one above the other. The top terrace is Lake Superior, the level of which is six hundred feet above the sea. From Lake Superior to the second terrace there is a drop of about twenty feet, and there we find the level of Lakes

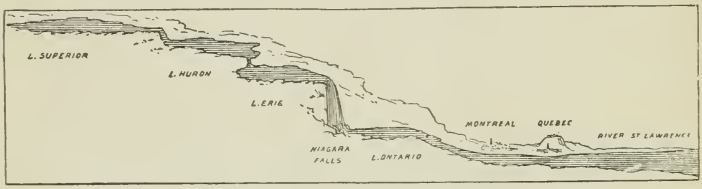


Diagram Showing the Lake Terraces.

Huron, Michigan, and Erie. The third drop, to the level of Lake Ontario, is much greater, and the ground slopes down the valley of the St. Lawrence to the sea.

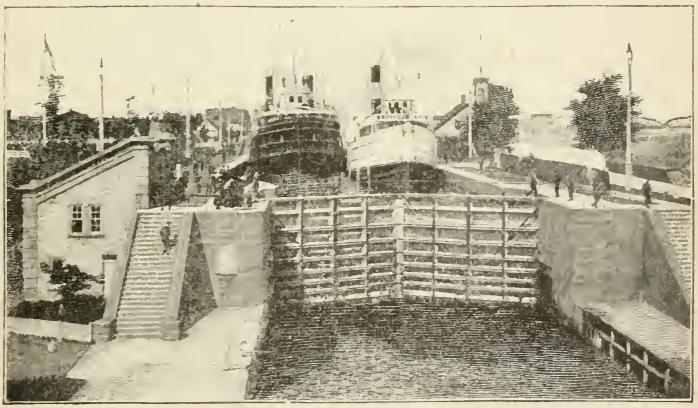
But how do the great ships get from one of these terraces to the other?

They cannot go from Lake Ontario up the swift Niagara River, and climb over the falls; nor can they possibly make their way up the raging, rocky rapids of the St. Marys River, over which the waters of Lake Superior foam as they rush on toward Lake Huron. No; this is plainly impossible. The ships must be lifted from one level to another through ship canals. Such canals have been built between Lake Ontario and Lake Erie, and around the Falls of the St. Marys, below Lake Superior; and in these, by means of locks, the heavy boats are likewise lowered from one terrace to the other. By many other locks they are lowered, step by step, through other canals, past the rapids of the St. Lawrence, until at last, having dropped from a height greater than that of the Washing-

ton Monument, they float on the Atlantic Ocean. It is by means of the same locks that they climb back again, vessels weighing thousands of tons being lifted up and down.

Let us sail from Lake Superior down into Lake Huron, and see how this is done. Our ship is a steel steamer of three thousand tons. It is floating on Lake Superior, and must be let down to the level of Lake Huron, which is twenty feet lower.

This will be done while passing through the St. Marys Falls Canal. It is commonly known as the "Soo" Canal,



Lock—St. Marys Falls Canal.

and is one of the greatest works of its kind in the world. It is about ten miles long, and forms a waterway around the rapids of the St. Marys River. Every seven months more than ten thousand vessels pass through it, and all of these ships have to be raised or lowered over this step twenty feet high between the two lakes.

We steam for some distance through the canal, until at last we pass, with another big steamer, between two stone

walls as high as a three-story house. They do not seem so high to us, for our ship floats between them on the top of the water, which is now at the level of Lake Superior. We are in the famous lock of the "Soo" Canal, the largest lock in the world. The upper deck of the steamer is far above the walls, and from it we can see, not far away to the left, the raging St. Marys River, which roars and froths as it tumbles down the rapids.

The water in the lock is as calm as a mill pond. It is held back by two large, water-tight gates of wood and iron. As our ship comes to rest, we step off upon the walls of the lock, and walk to the gates, over which we can look down into the canal, where it opens into the smooth expanse of the river below the rapids. The water there is twenty feet lower than that in the lock. If the gates were opened, the two ships would be hurled down by the great rush of the waters. By means of the lock they are to be lowered so gently that, did we shut our eyes, we could hardly tell we were sinking.

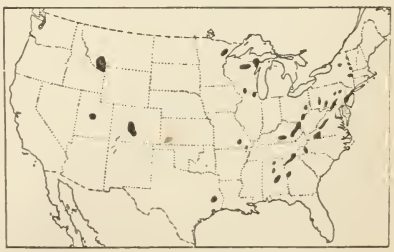
How is this done?

The water itself, aided by a steam engine, performs the work. At the entrance of the lock there are two gates like those before us. These are closed by the engine, keeping the waters of Lake Superior back for the time. The ships are now in a great box of water. The engineer moves another lever, and holes in the bottom of the box are opened. The water gradually flows out, and the great ships sink down with it until they are on the level of the canal below. Then the front gates are opened, and we can steam on our way as easily as though there had been no steep step to climb down. The waters of St. Marys River for the remaining fifty miles of its course are on the same level as those of Lake Huron.

There are two canals around the St. Marys Falls, one of which is on the Canadian side of the river. There are twenty-six locks in the Welland Ship Canal about Niagara Falls, for the step down from Lake Erie to Lake Ontario is more than fifteen times as high as that between Lake Huron and Lake Superior. So the ships are lifted up or down only a little at a time until they have passed through the canal, which is twenty-six miles long. There are other locks on the canals lower down about the rapids of the St. Lawrence, and there are many smaller locks in the Erie Canal between Buffalo and the Hudson River.

XXIII. THE IRON AND COPPER MINES OF LAKE SUPERIOR.

BEFORE leaving Lake Superior, we must visit the iron and copper regions which are found not far from its shores. The wealth of the United States is not in its good soil alone. A vast part of our riches comes from our minerals. We now produce more iron and copper than any other country, and in 1890 more than one fourth of the iron manufactured in the whole world came from the mines of the United States. For many years Great Britain has been the chief iron-making nation of the earth; but now the United States is ahead. It is our iron and coal which



The Iron Regions.

make us the chief manufacturing nation of the world; and our supplies of these materials are so vast that the United States will grow greater and greater as they are developed.

No other continent has such extensive beds of iron ore as North America. There is some iron in the West Indies, in Central America, and in Mexico, and a little in Canada. In the United States iron is found almost everywhere. It is mined in twenty-six different states and territories. There are vast iron beds in Tennessee, Alabama, and northwestern Georgia; there are also valuable iron mines in Pennsylvania; but our richest iron beds are about Lake Superior. It is from the Lake Superior mines that more than half the iron ore produced in the United States comes. Many of our large manufacturing cities rely upon this region for all the iron they use, and a fleet of fast steamers is kept busy carrying the ore down the Great Lakes to the furnaces where it is to be made into the iron of commerce. The chief article of freight upon the lakes, in fact, is iron ore, although, as we have seen, wheat, lumber, and other things by the thousands of tons are carried on them.

Iron in a state of nature is never found pure. As it lies in the earth, it is in veins or pockets, walled about with rock, and so mixed with stone that you cannot dig out a piece of iron that is perfectly pure. It is only by melting the iron with limestone, in a peculiar way called smelting, that we can get the pure iron out of the rock in which it is mixed.

Now smelting requires good coal. But there are no good coal fields within many hundreds of miles of Lake Superior. The iron can be taken to the coal easier than the coal can be brought to the iron. So the heavy iron ore is carried down through the Great Lakes to Detroit,

Toledo, Cleveland, Buffalo, Pittsburg, Chicago, and other points, to which the coal can be more cheaply transported. At these cities the coal and iron can easily be brought together, and hence we find them large manufacturing points.

But let me tell you something about the iron mines of the Lake Superior region. They lie south and west of the lake, in five little ranges of mountains. The best of the mines are from fifteen to one hundred miles back from the water, on the mountains, about a quarter of a mile higher than the level of the lake. Here there are great steam engines, enormous machines for pumping the water out of the mines, engines for compressing the air which drives the long steel drills into the rocky ore, so that dynamite candles can be inserted and the huge pieces of ironstone blasted down.

But suppose we take a look into one of the mines. We go down an inclined plane more than a thousand feet in a little ore car, and find ourselves in a network of great tunnels. There are electric lights everywhere, and the tunnels are almost as bright as day. Now and then we hear the boom! boom! boom! of the blasting going on in other parts of the mine. The sound shakes the air, and we fear lest the walls of the mine may fall down upon us. About us there are sooty-faced men, who lift up the great pieces of iron ore and throw them into little steel cars, which are to be carried by machinery to the surface.

Now we are again at the top. A car loaded with ore comes close behind us. Let us wait and go with it, and see how the ore is put in the ship. The slope of the railroad from the mines to the lakes is so great that the cars run down by their own weight.

The railroad track is built upon a great trestlework of steel almost a quarter of a mile out into the lake. It is

built high up above the water. Near the end of the trestle-work there are a number of big pockets, or bins, into which the ore is dumped from the cars. These bins are so high above the water that the iron-ore steamers can sail right under them; hence, by opening a door at the bottom, the ore can be dropped down into the holds of the steamers. In this way thousands of tons of iron can be loaded in a very few hours.

Our car goes rushing down this track. It thunders out over the trestlework, and we see the red-and-brown iron-stone dropped down into the bin. As we look, an ore steamer approaches, and a few hours later the ore is on its way to the furnaces. Could we follow it we should see it dumped out on other great piles of ore, on the wharves of Cleveland or some other lake city. A few days later it will perhaps be in an iron foundry, and may come out in the form of a steel rail to make part of a railroad on the great plains.

It is said that the richest copper mines of Lake Superior were discovered by a pig. These mines are situated on the Keweenaw Peninsula, the upper part of Michigan, which juts out into the lake. This peninsula is barren and rocky. It is not good for farming, but its rich copper beds have caused cities to be built, and there are now thousands of people living there. According to the story, a pig had strayed from the drove to which it belonged, and had fallen into a pit. In trying

The Copper Regions.

to root its way out, it uncovered a great mass of copper, and showed the world the site of one of the best copper mines that has ever been discovered. Vast fortunes have been made out of it, and several thousand men are now at work day and night in getting out the copper which lies buried there.

This mine is the famous Calumet and Hecla copper mine. It is in a slice of rock varying in width from that of the average parlor to the average hall, or from ten to fifteen feet wide, going down, down into the earth. This slice of rock is streaked and veined with almost pure copper. Some bits of the copper are so pure that they might almost be hammered into pennies, and one twentieth of the whole mass is copper.

There are many other mines in the Lake Superior region, but none so rich as this. The miners are now working more than a half-mile below the surface of the earth, and enormous steam engines haul up the steel cars filled with copper ore mixed with rock. Each car holds what would be a load for four horses. The ore is taken from the mines to the stamping mills not far away, and is there crushed into powder, so that the stone can be washed from the copper.

Copper, unlike iron, is often found in its pure state. It seldom combines with other minerals, although silver is sometimes mixed with it. The copper of Lake Superior is often found in solid masses, some of which weigh as much as five or six hundred tons. Such masses are broken up when possible, and the pieces are put into barrels and shipped down the lakes for smelting.

There are also smelting furnaces not far from the mines. Let us go to one of them and see the copper ore turned into bright bricks of reddish yellow. The copper, mixed with

coal and limestone, is put into the furnace. The fires are lighted, and the intense heat soon causes the whole to become one seething mass. Then a hole at the bottom of the furnace is opened, and a reddish-golden stream flows out. How hot it is! The stream is so bright that it dazzles our eyes. It makes us think of the sun when it sets like a great round red ball of fire in a clear sky.

As the copper flows out of the furnace, it is caught in long-handled iron dippers by men, who carry it, bubbling and blazing, to a set of iron molds fastened to a frame at the edge of a water trough. They pour the golden liquid into the molds. It hardens almost as soon as it touches the iron, and other men lift the molds with hooks, and turn them over, so that the metal, now in the shape of bricks, falls out into the trough. The water soon cools the hot copper.

Each brick is about two feet long, six inches wide, and four inches thick. It weighs about one hundred and thirty-five pounds. It is the color of a polished copper kettle, and it is now ready to be turned into wire, to be used for electrical machines or the making of brass, or even to be sent to our mint to be stamped into one-cent pieces.

Equally great, if not greater, than the Lake Superior copper region is that of Montana, of which we may see something during our travels in the western part of our country.

XXIV. LIFE IN THE LUMBER REGIONS.

WE shall spend the most of to-day in the woods, for some of the largest forests of the United States are to be found in the region of the Great Lakes. When our country was first discovered, almost all the land between

the Atlantic Ocean and the Mississippi River was one dense woods of pine, oak, maple, beech, and other trees. There were so many trees that no one thought of saving them. The settlers cut them down as fast as they could, in order

Lumbering.

to use the land for farming. They piled the trees up where they fell, and burned them. This work went on for many years, and in this way some of the most valuable timber in the United States has been lost.

There are, however, vast forests left in some parts of our country. The great pine lands of Maine still furnish lumber for many parts of the East. We traveled for miles through pine and cypress trees in our journeys along the South Atlantic coast and the lower Mississippi, and we

shall find wonderful trees in California and Oregon, and in the region about Puget Sound.

The forests of Wisconsin, Minnesota, and Michigan are so dense that you might get lost in them and travel for weeks without finding your way out. As we sailed up the Mississippi from St. Louis to St. Paul, we passed thousands of logs which were floating down the river toward the Gulf of Mexico. They had come from the forests of Minnesota and Wisconsin. They had been hauled upon the snow to the rivers and smaller streams which flow into the Mississippi, and were on their way to the markets. As we travel on down through the Great Lakes we shall meet other rafts of logs, which are towed by steamers; and at many of the ports we shall hear the scream of the gang saw as it cuts the logs into boards.

We use wood in a thousand different ways, and we ship quantities of it to Europe and Asia. We cut down so many trees every year, in fact, that if they could all be collected together we should have enough lumber to make a wooden track a foot thick, and more than twice as wide as the average country road, entirely round the world.

Lumbering in the Great Lakes region can be carried on only when the snow is on the ground. The cutting down of the trees is done by men who go into the woods in the fall and remain there all winter. They build big log cabins, filling the cracks between the logs with mud and sod. They have horses and often oxen with them, and for these they build stables. Often fifty men will live in one large cabin. They sleep in bunks, put up along the walls, and eat together at a common table, using tin plates and other dishes which will not easily break. They take enough provisions with them to last all winter. Each gang has its own cook, and the bill of fare of pork and beans, canned

meats, and hot bread is often varied by a venison stew or bear steak from game shot upon the ground.

In chopping, everything is done according to order. First, a man known as the underchopper goes through the forest and marks the trees to be cut. He knows what trees will make the best lumber. Then come the choppers

A Big Load of Logs.

and sawyers. A cut is first made in the tree with a long saw, which is pulled back and forth by a man at each end. Then the choppers with their axes chop above and beyond the saw cut until at last the great trunk is chopped through, and the giant of the forest falls with a crash to the ground. The limbs must now be trimmed off, and the logs sawed into the right lengths by a cross-cut saw.

The next thing is to get the logs to the stream. This is done on sledges, pulled by two or more horses over a road of snow or ice. In this way horses can haul many times as much as they could on a common road with a wagon. Sometimes a load of logs big enough to fill an ordinary bedroom from floor to ceiling is thus carried to the river or other stream. The first thing to be done is the making of the road. The snow is beaten down, then a sprinkling machine is used, and the water, freezing as it falls, forms a road of ice, over which the great loads can be easily pulled.

The streams to which the logs are carried are frozen in the winter, and the heavy logs are rolled off upon the ice, so that for a long distance the whole stream is bridged with logs. The ice is perhaps several feet thick, and it does not break under the great weight.

In the spring, when the thaw comes, the ice melts, the streams rise, and a freshet carries the logs down into the lakes, or into the Mississippi or other rivers.

A "Drive" of Logs.

Several men go with each collection, or "drive," of logs, in order to keep it moving and to prevent the logs from being scattered. The men jump from log to log, and are always watching to see that none lodge on stones or against the banks, for then the logs coming behind would be stopped and would cause a jam. These men have the soles of their boots covered with sharp nails in order to give them a sure footing. They have hooks and spikes

on long poles, with which they push and pull the logs this way and that. When a jam occurs, the logs become piled one on top of another. They act more like animals than wood. Some dive under the jam, some stand on end against it, and others climb up on top. After a short while they are so wedged together that you would think they could never be gotten apart. The logger, however, goes to the front of the jam, and with his pike, inch by inch, pulls out the logs forming the keystone, as it were, of the jam, and then the whole mass comes tumbling down into the river.

With nearly every gang of loggers there is a cook, who usually calls the men to meals by blowing upon a tin horn. Sometimes cabins are built on rafts, the rafts are floated down the river behind the logs, and in the cabins the cooking is done, and there the men sleep at night.

There are many sawmills along Lake Michigan, in which logs are sawed up into lumber ready to be shipped upon boats down the lakes. Some of the mills have what are know as gang saws, a number of saws moving up and down by machinery through a log, and sawing the whole log into boards at once. Others have what is known as the band saw. This is a wide belt of steel, one edge of which has teeth just like a saw. The band saw moves like a band of leather upon two great wheels, one high above the other. As the steel belt moves, the teeth in the front side of it saw through the logs, so that boards are thus made faster, it is said, than even the gang saws can cut them. The best of the pine lumber is used for the woodwork and finishing of houses. A large part of the refuse is turned into shingles, the bark and sawdust are used for fuel, and these great sawmills are so managed that almost every particle of the tree is made to serve some purpose.

XXV. OUR GREAT CITIES ON THE LAKES.

AS we sail down the lakes, we stop at some of the great cities which have been built up because of the facilities these waterways have given them for cheap transportation, manufacturing, and commerce.

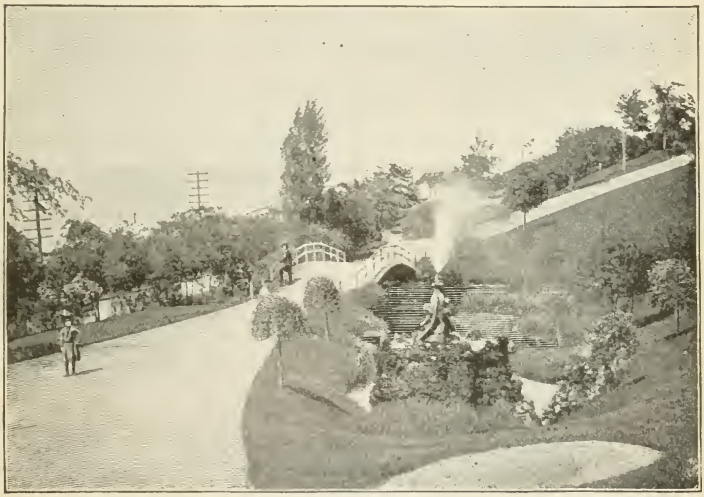
We pass ships loaded with lumber and iron as we leave Lake Huron and sail through the green expanse known as the St. Clair Flats, and into the Detroit River; and we learn that much lumber and iron are unloaded at Detroit.

Detroit is the largest city in Michigan. It lies on the west bank of the Detroit River, at a natural crossing between Canada and the United States. It is so situated that goods can be shipped from it by rail and water to all parts of the country. We find, therefore, that it has large car shops and other wood-working establishments. The commerce of the Detroit River is so great that, on an average, a vessel of some kind passes Detroit every seven and a half minutes during the season. The city has beautiful residences, and we enjoy our tour through its wide streets, upon which we walk in the shade of magnificent elm and maple trees.

From Detroit it is but a few hours' ride to Toledo, a large and prosperous city at the western end of Lake Erie. Farther on, about the middle of the southern shore of the lake, is the great port of Cleveland, celebrated for its manufactures of coal oil, iron ships for the lake trade, and all kinds of machinery. The city is situated at the mouth of the Cuyahoga River. We sail into the river, past enormous docks piled high with iron ore brought down from Lake Superior.

Cleveland is said to be the greatest iron-ore market in

the world. The mines which we have visited along Lake Superior are largely owned by Cleveland men, and many of the steel steamers which carry the ore down the lakes are built in Cleveland. We learn that the rich coal fields of Ohio and Pennsylvania are not far from this point, and



A Park Scene in Cleveland.

thus see that Cleveland can have cheap coal and cheap iron, which, together with its cheap water transportation, aid in making it so thriving a manufacturing city.

We take a walk through Cleveland, stopping for a moment upon the great stone viaduct which crosses the Cuyahoga River, uniting the east and west sides of the city, and then go on into Superior Street and visit the chief business portions of the town.

We stop in the beautiful park in the center of Cleveland to take a look at the bronze statue of Captain Perry, rep-

resenting him as he looked when he so bravely charged and captured the British squadron on Lake Erie, in the War of 1812. Perry was only twenty-seven years old at the time of that battle. The British expected an easy victory, but he defeated them; and in sending the news of his triumph to General W. H. Harrison, he used the words which have since become historical:

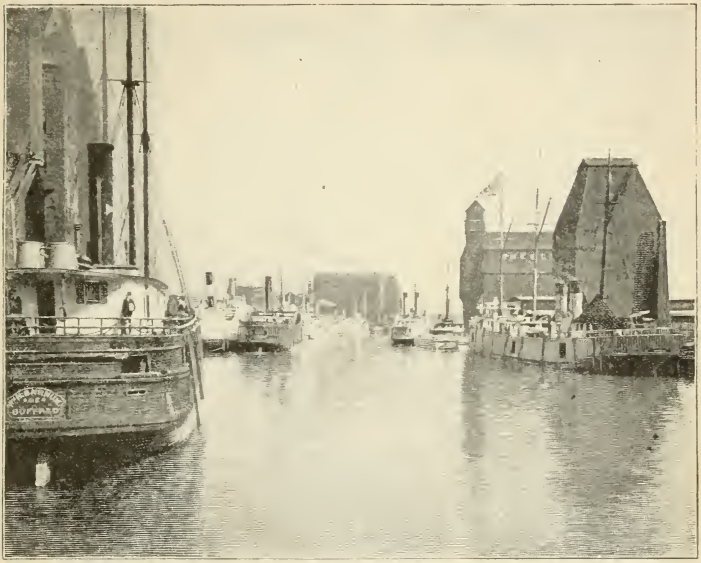
"We have met the enemy, and they are ours."

A walk upon Euclid Avenue shows us one of the finest streets in the world. The residences are of stone, wood, and brick, and of all styles of architecture. Their chief beauty, however, lies in the velvety lawns which surround the houses, and in the old forest trees which make each side of the street look like a great park.

Tomb of President Garfield.

We next visit the beautiful cemetery near the lake to see the marble monument under which President Garfield lies buried. Then, coming back to the wharf, we continue our trip on Lake Erie to Buffalo.

Our huge steamer moves smoothly and majestically over the waves. We go to bed in our cabins shortly after leaving, and awake in the morning to find ourselves in front of the city of Buffalo. Buffalo is situated at the chief gateway between the sea and the vast regions of the upper lakes. Not far from it is the head of the Welland Canal,



The Harbor at Buffalo.

which connects Lake Erie with Lake Ontario and the St. Lawrence; and the Erie Canal, with its terminus at Buffalo, connects the lakes with the great ocean commerce which reaches us by way of New York and through the Hudson River. The latter waterway has so cheapened the carrying of freight to the interior of our country that Buffalo has become a great port.

It is wonderful how a new waterway will often change the commerce of a country. The digging of the Erie Canal largely aided in making New York the greatest city in the United States. Before this canal was built, it was cheaper to send freight across the mountains to Pittsburg. It then took twenty days and cost one hundred dollars to carry a ton of goods from Buffalo to New York. When the

canal was finished it cost at first only fourteen dollars a ton; and now you can send things from New York to Buffalo for one dollar a ton, and some articles cost less than fifty cents a ton.

Before the canal was built, wheat was a very expensive article in the eastern states. In some places wheat bread was a luxury, and not to be used as a common food. Rye flour and corn meal took the place of wheat flour. It is through cheap water transportation that we are able to get flour at such low prices. How would you like to carry a bushel of wheat hundreds of miles for two cents? It now costs only about two cents to carry a bushel of wheat from Buffalo to New York by way of the Erie Canal, and the freight rates on the Great Lakes above are so low that the wheat we saw loaded in Duluth will be landed in Buffalo for something like three cents a bushel; so that it costs less than ten cents a bushel to bring grain from the Red River Valley to New York. The freight on flour is very cheap, and the bread which we shall eat at our dinner to-day in Buffalo was probably made from flour that came more than a thousand miles on the lakes.

The freight on iron ore from the mines of Lake Superior to Buffalo is often less than half a cent a pound, while the ore steamers will carry coal from here back to Duluth for from fifteen to thirty cents a ton. A ton of coal is a good wagonload for two horses on a country road. Think of carrying a wagonload of stuff from Buffalo to Duluth for fifteen cents, and you can see how cheaply goods are now taken from one part of our land to another by means of the lakes.

With such advantages, what should we expect to find here at Buffalo?

We should look for grain elevators for storing this wheat

until it can be shipped from the lakes to the canal. Well, there are fifty-one such elevators at Buffalo, and the city claims to be the chief grain-shipping port of the world. We should also expect to find flour mills. Buffalo has so many of them that they grind out more than a million barrels of flour a year. There are rich coal fields in New York and Pennsylvania, not far south of Buffalo, and we therefore see vast coal trestles for loading hard and soft coal upon the steamers. Near them are the iron-ore docks; and not far away we find machine shops, foundries, and factories, in which are made many kinds of merchandise.

There are more than a hundred thousand persons here engaged in manufacturing, and we see that Buffalo is a rich and fast-growing city.

XXVI. A VISIT TO NIAGARA FALLS.

NIAGARA FALLS is only a few miles from Buffalo. We can take the steam railroad and get there in half an hour, or we can ride on an electric trolley car to view this wonderful work of nature. The trolley car carries us for miles along the Niagara River below the falls, and from it we can see the deep gorge through which the river runs, after its great tumble, on its way to Lake Ontario.

The Niagara is one of the most wonderful rivers in the world. Some of its waters come from Lake Superior, and we have seen how they flow out of that great basin, through the St. Marys River, down to the level of Lake Huron. It was by means of the huge locks at the St. Marys Falls Canal that we were lifted down the twenty-foot step which lies between these two great lakes. We

could not notice that we were going downhill as we sailed on through the Detroit River and across Lake Erie to Buffalo, for the descent between the foot of the St. Marys Canal and the head of the Niagara River is very slight.

Niagara Falls.

Here, however, the mighty waters are poured from the Erie basin into that of Lake Ontario, which is three hundred and thirty feet below. The Niagara River is the

great down spout through which they run. It is only thirty-three miles long, and it makes more than half of its descent in one jump at Niagara Falls.

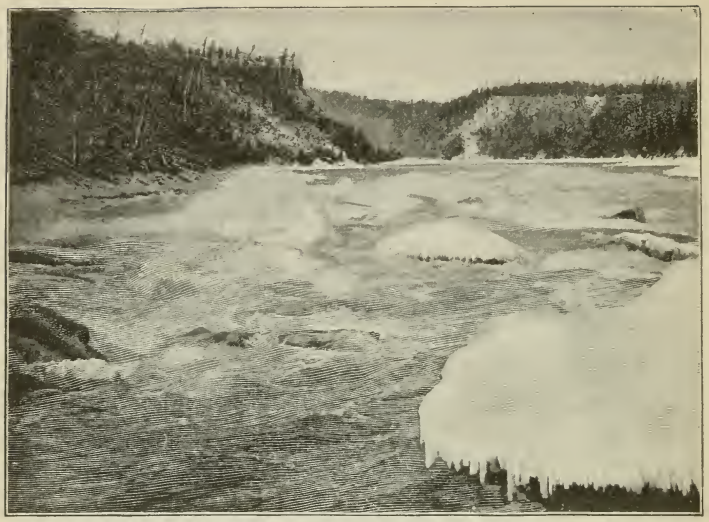
The volume of water which flows between the banks of the Niagara is so great that every minute more than half a million tons of water are dropped over the falls; and the force with which this water descends is estimated to be greater than that of all the steam engines of our country working together.

The course of the Niagara, as it runs from Lake Erie to Lake Ontario, is nearly due north. As it flows out of Lake Erie, the stream is almost as quiet as a mill pond, and at first the fall is not more than a foot to the mile. Shortly after leaving Lake Erie, the river divides and passes round Grand Island. At the lower end of this island it is more than a mile broad. It is still quiet, and it moves slowly on until it comes within a mile of the falls.

Then the river becomes narrower, the rapids begin, and you see the waters boiling as they sweep among rocks and about islands. They seem to be rousing themselves up for their great jump. They foam as they dash about Goat Island, which lies on the edge of the falls, and then take their hundred-and-sixty-foot leap downward into the great abyss below.

For the next seven miles the river flows through a ravine the banks of which rise almost straight upward for from two to three hundred feet above the water. The river seems to give out mighty sighs as it rushes between the banks. Its waters are churned about in whirlpools. They seethe and foam until they pass Lewiston, at the end of the gorge, when they suddenly become quiet and flow peacefully on into Lake Ontario.

Our trolley car carries us to the village of Niagara Falls,



Whirlpool and Rapids.

a thriving town which has grown up for the accommodation of the thousands of tourists who come here every season Near by is the State Reservation, surrounding the American side of the falls, and corresponding to it is Queen Victoria Park, which the Canadians have established on the opposite bank of the river.

In former times much complaint was made of the extortion which the hack drivers and guides practiced at Niagara. Now everything is regulated by law, and we find we can make the trip very cheaply. There are coaches which take us across the suspension bridge and give us a tour of the islands and all the points of interest about the falls. Our round-trip tickets cost only fifteen cents, and we have the right to stop and wait for other coaches at the interesting places.

We first drive to Goat Island and see how the two great falls are divided by this high patch of green. On our right are the American Falls, as high but not so wide as the Horseshoe Falls, which extend, in the shape of a great crescent, to the shores of Canada, on our left.

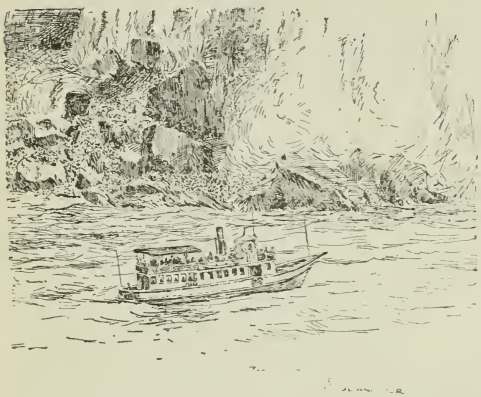
What a thick mist rises up from the water! How the river thunders as it goes over the rocks! The noise is so great that it is said it can be heard forty miles away. The waters sparkle as they fall. They bubble and seethe and foam in angry motion in their bed below us. Now the sun comes out from behind a cloud. It darts its rays into the mist, and paints rainbows there. The rainbows change as we look, and new rainbows appear as the water dashes upward in a diamond spray.

We stop on the bridge above the falls, and a little later go to the Cave of the Winds. This cave is right under the falls, and we must have a costume and a guide before we can undertake the journey. We can get both for a dollar. We put on rubber coats and caps, and rude pantaloons or bloomers. Our feet are shod with felt slippers, in order that we may not slip, for the descent is by no means unattended with danger. Our guides take us down a wooden staircase along the rocks, until at last we are right under the splashing torrent. The noise almost deafens us as we go into the cave, and as we stand there and look out, the sun peeps through the spray, and we have a curtain of rainbows.

Another thrilling experience is our ride under the falls in the steamboat known as the *Maid of the Mist.* This little boat has powerful machinery, which carries it in and out among the rocks through the boiling waters from one side of the river to the other.

We also visit the whirlpool, and the rapids above it; and

then take a walk over the great steel arch bridge which crosses the Niagara, connecting Canada with the United States. From here we get another fine view of the falls.



Maid of the Mist.

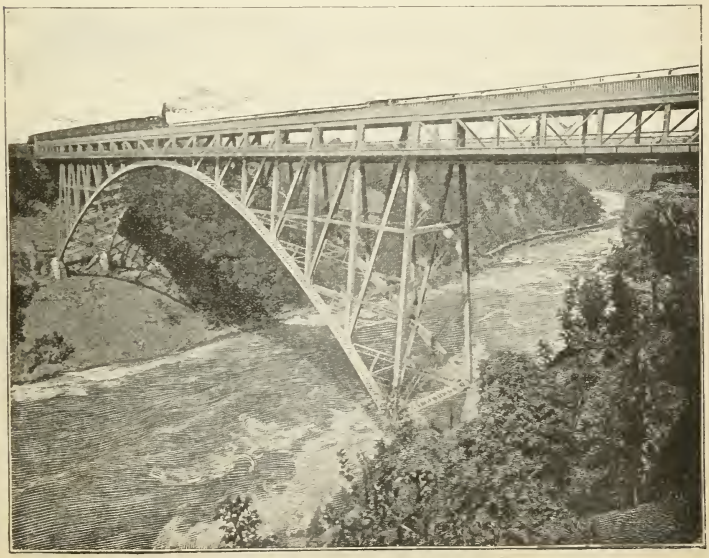
The bridge itself is a wonder. It crosses right over the raging torrent. It is a mighty arch of steel, with a span of five hundred and fifty feet, said to be the largest span of this kind in the world. Its approaches are two hundred and ninety feet long, and the bridge weighs seven million pounds. On its top there are two tracks for railroads, and below are wagonways, sidewalks, and trolley-car tracks.

The first suspension bridge was put across this gorge more than half a century ago, and you will be interested to know how boys aided in its construction. A civil engineer, Mr. Charles Ellet, had planned the bridge. He wished to get a line from one side to the other; so he offered a reward of five dollars to any one who could get a string across the chasm. The next windy day, scores of boys with kites in their hands were on the American bank of the river, and before night a lucky youth had landed his kite on the opposite side, and secured the reward.

To the kite string there was now fastened a strong cord, and this was pulled from one side to the other. Then, by

means of the cord, a rope was drawn across the river. A cable made of wires about as thick as a man's thumb was tied to the rope. When the cable had been drawn across, its ends were fastened to wooden scaffolds built upon each side of the river. Now an iron basket was hung on the cable, so that the workmen could be drawn in it from one side to the other.

Mr. Ellet was the first man who went over in the basket, and his trip across the river created a great sensation. Then stone towers were built. Heavy cables were carried across from one bank to the other, and little by little the suspension bridge was made. At first people would not trust themselves upon the bridge; but after Mr. Ellet had driven a team of horses over it, they lost their fear, and it



Steel Arch Bridge across the Niagara.

came into general use. A few years later the first railroad suspension bridge was built, and now we have the magnificent structure upon which we cross to-day.

Another wonderful piece of engineering connected with Niagara Falls is the tunnel which has been built to harness a part of this immense water power and make it work for man. The Niagara Tunnel is really a great pipe extending about a mile from the level of the river above the falls to a point a short distance below them. In the tunnel, pits have been sunk for the insertion of immense turbine wheels, which are driven round and round by the water as it falls upon them. Attached to each wheel are dynamos for the generation of electricity, and the machinery is such that each wheel exerts as much force as five thousand horses all working at once.

The electricity thus made is used to run many factories near the falls. Some of it goes through wires to Buffalo, to furnish power for the machine shops there; and there are people who believe that modern invention will in the future so perfect the use of the Niagara water power that there will be a gigantic manufacturing city about the falls. Some think that, by means of wires, the power will be carried to Cleveland, Chicago, and New York, so that the falls will do the work of a hundred cities.

Our next stop is to be at Pittsburg, and were all of this vast water power available, we might be carried there by means of the Niagara River. This, however, has yet to be accomplished, and we shall go on the old-fashioned railroad, with coal and steam, instead of water and electricity, pushing our cars.

XXVII. TRAVELS IN THE OIL REGIONS.

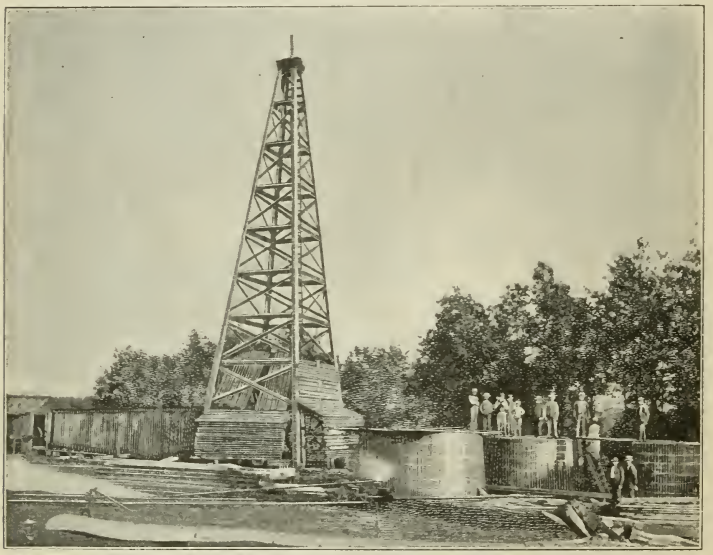
WE shall visit to-day some of the oil fields of the United States. There are parts of our country under which lie vast beds of porous rock, filled with coal oil and natural gas. The first oil field that was of practical use to the world lies in northwestern Pennsylvania and southwestern New York, not far from Buffalo, on the western plateau of the Appalachian Mountains. This is the largest of our oil fields, and it is the one through which we shall travel to-day.

We see signs of coal oil very soon after leaving Buffalo. We pass long railroad trains made up of huge iron cylinders filled with oil. We travel through regions where hundreds of derricks, or wooden frames for raising the oil, have been built up high above the earth. We see vast inverted tubs of iron standing here and there on the sides of the tracks, and a smell of petroleum fills the air. Each of the derricks stands over an oil well. The inverted tubs are the iron tanks for storing the oil. Each of them holds from twenty-five thousand to thirty thousand barrels of oil. There are pipes covering the land like a network, which carry the oil here and there. The very earth seems greasy, and the streams are coated with the steel-blue skum of petroleum.

We stop at Titusville, Pennsylvania, where the first oil well was sunk. This was in August, 1858. Before that, no one knew that there were enormous quantities of coal oil underground. Most people used candles of tallow or wax, or little wicks floating in saucers of tallow or sperm oil, for light. They did this even in the oil regions, not-

withstanding some of the petroleum came out on the surface of the ground.

Petroleum was then called rock oil, and the Indians laid cloths on the ground and soaked it up, in order to use it for medicine. It was supposed to be good for rheumatism and sore throat, and to make the hair grow. The farmers



Oil Derrick and Tanks.

thought it hurt the land, and it is said that one man sold out and moved off to Canada because the oil came out upon his ponds and spoiled the drinking water for his cattle. After oil was discovered, this farm brought a fortune to its owner.

Drake, the man who bored the first well near Titusville, thought that if there was so much oil on the top of the

ground, there must be a great deal below, so he drilled down into the earth for it. At sixty-nine feet he struck oil, and the greasy fluid flowed forth at the rate of thirty-five barrels a day. When this was reported to other parts of the country, it was laughed at; but later on other wells were sunk. It was soon found that the real source of the oil was much deeper than sixty-nine feet, the best wells being those which went down from thirteen hundred to two thousand feet and more into the ground.

It is very difficult to bore such deep holes through the rocks. Derricks have to be erected to hold the long steel drilling tools, which are so heavy that it would take two horses to haul a set of them. Steam engines are placed beside the derricks, and the engines keep raising and dropping the heavy drills upon the rock until a hole is forced down into the earth a quarter of a mile or more.

When the oil is struck, a big torpedo of nitroglycerin is put down into the well and exploded, and the oil sometimes gushes forth at the rate of hundreds and even thousands of barrels a day. From some wells the oil has to be pumped; from others it flows freely for a long time without pumping.

At first petroleum was thought to be of but very little value. Indeed, it is said that some wells were sunk simply for the novelty of seeing the oil spout up into the air. Tens of thousands of barrels of the crude oil were allowed to flow into the creeks and rivers, for no one had yet learned how to utilize it. It was not long, however, until some one discovered a method of refining it and thus removing its impurities. Then it was discovered that by the use of chimneys, properly made, the refined oil could be burned in lamps, giving no smoke, and making a much better light than any other oil then known.

A Burning Oil Well.

Little by little, the value of petroleum for other purposes became known and appreciated. It is now used for making gasoline and illuminating gas; and a great deal is manufactured into benzine and used in the making of India rubber and rubber goods. Out of the refuse from refining it come vaseline and other things. Indeed, it is said that two hundred important products are made from crude petroleum. Its principal use, however, is for burning in lamps, where it has superseded all other oils. The refined oil used for this purpose is called kerosene.

Within a few years after Captain Drake struck oil, this part of Pennsylvania was filled with men from all parts of the world who had come here to make their fortunes. Cities grew up in different parts of the oil territory, and a vast industry was founded to get the oil out of the earth and to prepare it for the markets. Since then we have produced at times more than fifty million barrels of oil a

year, and to-day our petroleum has a wider sale than any other thing we ship abroad.

Our oil is now sent to all parts of the world. It is used by the people of every continent. It is carried on camels over the deserts of Africa. I have seen it pushed in cans on wheelbarrows in the streets of Peking in China, and have watched the natives of India burning it in their huts on the Himalaya Mountains. Ships are always on the ocean carrying it to foreign lands.

Great tank steamers have been built for carrying the oil over the seas; and a network of iron pipes has been laid, so that the oil in the iron tanks which we see in the oil regions can be pumped over the mountains and through the valleys to Baltimore, Philadelphia, and New York, where there are refineries in which it is prepared for use, and from where it is sent, through other pipes, to the steamers. There are lines of pipe also running from the oil regions to Cleveland, Pittsburg, and Chicago, so that by the turning of a valve the owner of the oil can let it out into a pipe in which it will flow to almost any market he wishes. The pipe lines of the United States are indeed so many that if stretched out in one single line they would reach entirely round the world.

In our travels through the oil region we pass through towns whose streets at first seem to be filled with torchlight processions. A second look shows us that the torches are stationary, and that each consists of a round black pipe, out of which comes a waving flame of fire. That flame is produced by natural gas. It flows forth from the depths of the earth. It comes from huge gas reservoirs made by nature, hundreds of feet below the surface of the ground. Such reservoirs are common in the oil regions, where the gas and oil are often found close together.

Men drill for gas much as they do for oil. They bore holes into the earth by means of derricks and drilling tools, going down from one thousand to several thousand feet before they get through the hard rock which forms the heavy, tight roof to the porous rock in which the gas is stored.

When the gas rock is struck, the gas rushes out with great force. It carries water and stone up with it at first, and a pipe is driven down into the well to keep water from flowing into it. After this the stream of gas comes out of the top of the pipe so fast that in a good well it is impossible to strike the mouth of the pipe with a sledgehammer. It falls upon the stream of gas as though upon a rubber cushion, and the gas throws it up from the pipe. Hurl a baseball club into the stream. It will be carried eighty feet or more into the air, and as it descends into the stream it will be lifted again and again, until at last, coming outside the current, it will drop to the ground.

I have taken a hammer and tried to hit the top of the two-inch pipe of a small gas well. The gas stream threw the hammer upward again and again, and I could not pound the iron. The gas coming out of this little pipe made a noise which was almost deafening. The stream of gas was of a bluish color, and upon my putting my fingers close to it, I found it was as cold as ice.

Some of the richest gas fields of the United States are in western Ohio and eastern Indiana. The gas from these places is piped to Toledo, Indianapolis, and other towns, and is used for manufacturing.

In my travels in western Ohio, I was once shown the wonderful force of the great Karg Well, near Findlay, which was then flowing twelve million cubic feet of gas a day. A pipe four inches in diameter had been run out

from the well above the banks of a little river. A match was held in front of the pipe, and a lever was turned so that the gas came slowly out. It was lighted, and first formed what seemed like a bonfire hanging above the water. Then the pipe was gradually opened, and the flame increased until at last the gas poured forth with a roar greater than that of Niagara. The flame spread out like a great sheet. It was from thirty to forty feet long. It hung over the rapid-running water, making it so warm that clouds of steam rose up and touched the flame. The noise shook the earth. The heavy iron pipe quivered as the gas came forth, and the air was so hot near the stream as to be almost unendurable. Still the end of the pipe was cold. The rush of the gas was so great that it blew the fire five feet away from the mouth of the pipe.

A Burning Gas Well.

I threw blocks of wood and pieces of stone into the gas, and saw them carried far out into the river. The sheet of flame was steady, and the noise lasted until a valve, which moved so gently that a boy could operate it, was turned and the gas shut off.

Gas fields are of great value to the towns near them.

All the cooking and warming of the houses is done by gas, so that there is no wood or coal to carry in, nor ashes to take out. The fires are made by dropping pieces of lighted paper into the stoves, and a twist of the finger turns the valve that lets in the gas. A turn the other way, and your fire is out; or it will burn all day and all night, if you wish it.

Gas is often burned in grates, the jets coming out of sheets of asbestos, which are so roughed up that the flame looks like frosted gold as it plays over them. In some grates pieces of slag and rock are thrown, and the burning gas makes them red-hot, and you have what looks like a fire of blazing coals. In fireplaces the people have gas logs made of clay, which, when the gas is lighted, remind you of a wood fire; and in the kitchen stoves sticks of artificial wood take the place of the real article.

Natural gas has an enormous heating power, and we shall see it largely used in the furnaces of Pittsburg, where it furnishes the heat for the making of glass and for some of the processes of iron manufacture.

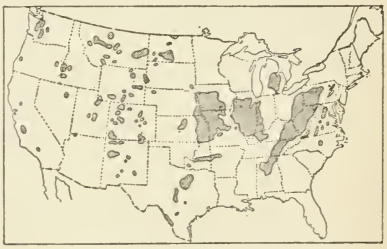
We find factories in this region in which the gas is used as fuel, and the factories and foundries increase as our train carries us on down the valley of the Allegheny River. At last there seem to be machine shops everywhere. Surrounding almost every town, and scattered through it, there is a forest of smokestacks, from which, as the evening shades come on, flames rise upward, lighting up the country for miles around, and making a scene which is weird, ghostlike, and almost terrible.

We are now nearing one of the greatest manufacturing cities of the United States. We are in the suburbs of the smoky city of Pittsburg, in which thousands of men are busy day and night making iron and iron manufactures.

XXVIII. TRAVELS IN THE COAL REGIONS.

HAVE you ever thought what strange things there are away down under the ground?

We saw some of them when we visited the copper and iron mines of Lake Superior; we saw others in the natural gas and oil fields; and to-day we are to examine something else, which is even more wonderful. It is something that we use every day, and which we could not well get along without. It is coal.



The Coal Regions.

Have you ever thought what a wonderful thing coal is?

Take up a lump of the dirty black stuff and look at it. Can you realize that that lump was once parts of plants and vegetables? that it was growing ages and ages ago, and then became so covered over with earth and stone that after a long time it hardened and turned into coal? Coal, coal oil, and natural gas, with respect to one another, might be called cousins. It is thought that all were made in much the same way, and they are, as you know, of much the same nature.

Men lived for thousands of years upon the earth before they learned that coal was good to burn. All the iron used before the days of the middle ages was smelted from the ore with charcoal. A fairy tale is told of how a Belgian blacksmith discovered that stone coal was good for iron making. This blacksmith was a very poor man. He had to make the charcoal which he used in his forge,

but he found it took so much time that, hard as he might work, he was not able to make enough money to keep his family. At last, in despair, he was about to kill himself, when a white-bearded old man appeared at his shop, and told him to go to the mountains near by and dig out the black earth and burn it. He did so, and was able to make a horseshoe at one forging. This is the Belgian story of the discovery of coal.

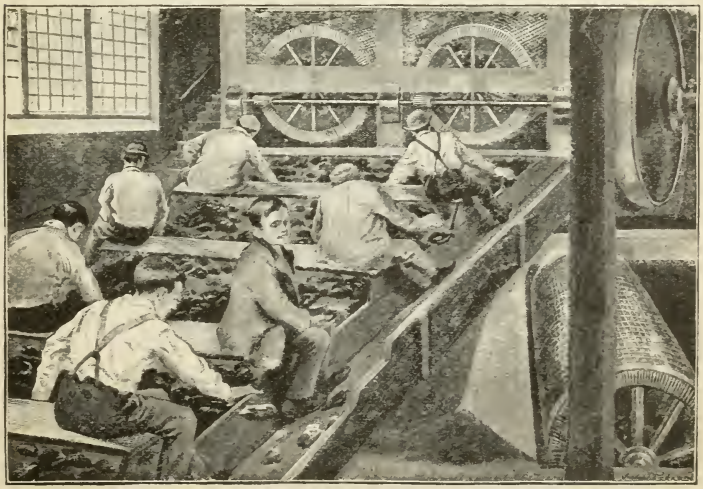
The first coal found in America was near Ottawa, Illinois. It was found by Father Hennepin, a French explorer who traveled through that part of our country in 1679.

The first coal mines worked in the United States were not far from Richmond, Virginia. This coal region was discovered by a boy who was fishing. While he was hunting for crabs for bait in a small creek, he stumbled on the outcroppings of the James River coal beds.

Coal is of different kinds. Bituminous or soft coal can be broken without trouble, and some kinds of it burn so easily that a lump can be lighted with a match. Anthracite coal is almost as hard as stone, and is very difficult to break. It was a long time after soft coal was used before people knew that anthracite coal would burn. Still, anthracite coal now forms a large part of the fuel of the United States. There is a little anthracite-coal region in northeastern Pennsylvania, about Wilkesbarre and Scranton, two hundred miles from New York city, and about one hundred and twenty miles from Philadelphia, which produces every year coal that sells for more than the annual product of all the gold mines of the United States. It is the richest coal field in the world. More than fifty million tons of hard coal are taken out of it every year, and the mining has been going on for seventy-five years.

These coal fields are said to have been discovered by Nicho Allen, when George Washington was President of the United States. Allen was a hunter. One night he encamped in this region, building a wood fire upon some black stones. After dinner he lay down by the fire and went to sleep. He awoke to find himself almost roasted. The stones were on fire, and Pennsylvania anthracite coal was burning for the first time.

Shortly after this a company was formed to sell the new coal. Some of it was shipped to Philadelphia; but the people did not know how to use it, and could not make it burn. It was very unpopular, and those who had bought it thought they had been cheated. Some of them finally got a writ from the city authorities denouncing the men who sold anthracite as knaves and scoundrels for trying to impose rocks upon the people for coal.



A Coal Breaker.

Anthracite coal as it comes out of the mines contains great quantities of stone, slate, and dust. It has to be broken up and picked over before it can be used. This is done in what are known as coal breakers. A coal breaker is a building almost as big as one of the grain elevators we saw at Duluth. The coal is taken to the top, and by machinery the lumps are separated into different sizes. They are then run through inclined troughs, or chutes, and boys, who are paid about fifty cents a day, pick out the slate and other rubbish as the coal goes by.

The chief coal of the world, however, is bituminous or soft coal. This coal is found in many parts of the United States; and it is interesting to know that we have more coal than any other country in the world, just as we have more and better iron. This is a very valuable thing for us as a nation, because manufacturing is chiefly done by means of coal and iron, and hence we shall always have plenty to do in making things to sell.

Coal, in fact, exists in three fourths of our states and territories, and it is mined in thirty of them. The most of the coal of North America is in the section east of the Mississippi River, and by far the greater part lies in the Appalachian Mountains. From the northern part of Pennsylvania, running down through these mountains clear into central Alabama, there is a great bed of bituminous coal which is from eighty to ninety miles wide. This coal bed is one of the largest and richest known to the world. It could supply the world with fuel for hundreds of years.

Another big coal field is found in Indiana and Illinois. The western parts of Kentucky and Missouri have good coal fields, and so have the states of Montana, Washington, and Wyoming. Colorado and Utah have also rich deposits of coal.

Near Pittsburg the coal vein is about six feet thick; and in going along the Ohio River, and looking at the banks, you can see the black bed of coal standing out between the rocks above and below.

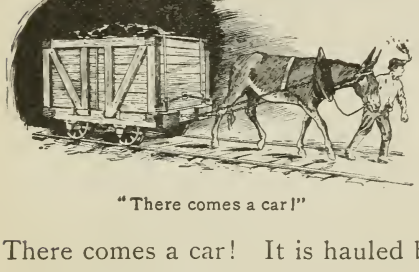
Vast amounts of coal are shipped from Pittsburg to many parts of our country. One railroad company has fifty thousand coal cars, and nine hundred locomotives which are used for coal-carrying alone; another road has seventy thousand cars; and a million people are kept busy in handling coal. We passed immense barges of coal which came from Pittsburg as we rode up the Mississippi; we saw coal going up the Great Lakes in boats which steamed by us as we came down to Buffalo; and now we find the Ohio River at Pittsburg almost filled with barges ready to be floated down to Cincinnati, Louisville, Cairo, and New Orleans.

Let us take a boat from Pittsburg, and ride up the Monongahela River. The stream has cut its course deep down into the earth; and we can see great black pits showing out upon the green walls of the hillsides. Those black spots are the openings of coal mines, and the little villages below them, with their smoke-blackened houses running along narrow streets up the sides of the hills, are the houses of the miners.

Keep your eyes on the black holes. See the noisy cars coming out on the run, drawn by mules. Watch them as they are put on the inclined railroads and rush down and discharge their coal into the barges below. For half a century they have been taking coal out of those hills, and there are vast quantities left.

Let us go into one of the mines. We crawl down through tunnel after tunnel, our way being lighted by the little lamps used by the miners. The faces of the men are

as black as the coal, and they make us think of ghosts as we see them through the dim light in the distance. Notice how the tunnels are upheld by wood. The water drips down upon us as we go through, and we walk along a little railroad track which has been made for the coal cars.



"There comes a car!"

Look behind you! Stand as close to the wall as you can. There comes a car! It is hauled by a mule, which comes on a trot, hurrying even faster as he goes by us. We walk for miles through one tunnel after another. The tunnels have been cut out of the coal, and there is only slate and rock above and below. Now and then we stop in rooms or chambers made by taking out the coal. The mines make us think of a city, there are so many passage-ways, which cross one another like streets.

We can see how dangerous the work of mining is. The walls sometimes fall in and the miners are crushed. Sometimes the mines are flooded, and the miners, shut off by the stopping up of the tunnels, are drowned.

Another great danger is from what is known as fire damp. There are many gases in coal mines, and these are sometimes set on fire by the candles or lamps of the miners. This causes a great explosion. As quick as a stroke of lightning, and with a clap like thunder, a whirlwind of flame goes through the tunnels, pulling down the timbers and caving in the walls. The men are blinded, scorched, and sometimes burned to cinders, and hundreds are often killed at one time.

Our miners have a dangerous and difficult occupation. They are, however, much better off than the miners of other countries. Their work is easier and their wages higher. In England the coal veins are so thin that much of the digging out of the coal has to be done by men lying on their sides; and in Belgium the coal cars are often pulled by men and women. Children are rarely employed in the American mines; but less than a generation ago little boys and girls were used to haul coal cars in the mines of England and Scotland. They were harnessed to

Coal Miners at Work.

the cars by chains fastened to belts about their waists, and they crawled along through the low tunnels on all fours, dragging the coal to the surface.

Mining is now going on all through this great Appalachian coal field. Cities have been built up by means

of the cheap fuel, and a wonderful growth in manufacturing is being made by this means. This is especially so at the southern end of the coal beds. Valuable deposits of iron are found to lie there very close to the coal, and the region about Birmingham, Alabama, promises some day to rival Pittsburg as an iron- and steel-making center. Nashville and Chattanooga, in Tennessee, are other cities which are rapidly growing on account of the abundance of cheap iron and coal.

XXIX. PITTSBURG AND ITS IRON WORKS.

SOME of the most interesting sights about Pittsburg are to be seen after dark. The great iron mills are kept running all night long, and out of their huge chimneys flow raging flames, mixed with smoke. If we take the inclined railway and go to the top of the hills about the city, we shall see such fires in every direction; and in traveling at night over some of the railroads coming to Pittsburg, we ride long distances by what seem to be mounds of blazing fire. These are the coke ovens, in which the coal is roasted or baked before it is used for smelting iron.

It seems funny to think of roasting coal, does it not?

Yes; but the coal must be purified before it is good for smelting, and it is this roasting that purifies it. By a short ride on the railroad we reach Connellsville, and see how the coking is done. Our train takes us by thousands of coking ovens. The ovens are moundlike affairs of brick and stone, built much in the shape of an old-fashioned beehive, save that they are connected, and that each

Coke Ovens.

oven is almost as large as a gas tank. Each has a little door at the side, and a hole in the top to let out the smoke.

When the ovens are filled with coal, the doors are walled up with fire brick. When the oven is first started the coal is lighted by means of wood, just as a coal fire is lighted; but after a while the oven becomes so hot that the heat from the last charge fires the next. After half an hour a pale-blue smoke comes out of the top; a little later on it grows darker; and in less than an hour there is a puff like powder, which shows you the coal has been lit. The coal is allowed to burn for about seventy-two hours.

There is an oven burning. Look into it. It is a mass

of red-hot coals. The heat is intense, but the coal burns so slowly that it does not go to ashes, and in seventy-two hours the impurities have gone out of it. It will now be cooled by pouring cold water in at the top, after which it will be dragged out with a great iron rake, and loaded up on the cars for the furnaces.

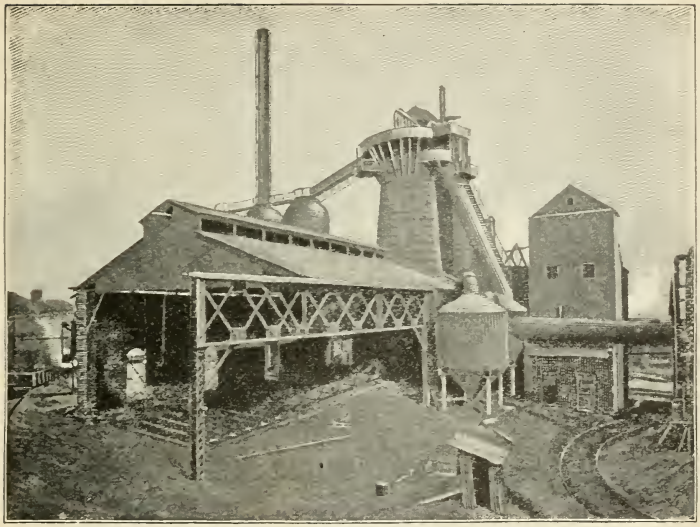
Let us jump on that car of coke, and go with it to Pittsburg, and learn how iron is made.

We find that a number of processes must be gone through before the iron ore, as we saw it in the mines, can be used for machinery. We have already learned that there is no such thing as pure iron in nature; and that iron as it is found in the earth is always mixed with rock and other minerals. It is by smelting that these are taken out and the iron left in the shape that we use it.

One of the chief places for doing this thing is Pittsburg. The blast furnaces in which the smelting is done are about as tall as a six-story house. They are immense round iron pipes or tubes. Into them is poured, first a layer of iron ore; then a layer of coke, and then a layer of limestone. Then there are other layers of iron ore, coke, and limestone, until the great furnace is filled. Limestone, as well as coke, is required to produce the change from iron ore to iron.

Now the furnace is ready for the fire. But no ordinary fire would melt iron ore. The heat is increased by means of a draught until it becomes so intense that the coke, limestone, and ore melt together like sugar under it. After a short time the whole is one molten mass, and the iron is ready to be drawn out.

Let us stand at one of the furnaces and see how this is done. At the bottom of the furnace there is a hole, which is stopped up until the mixture is melted. Now it is

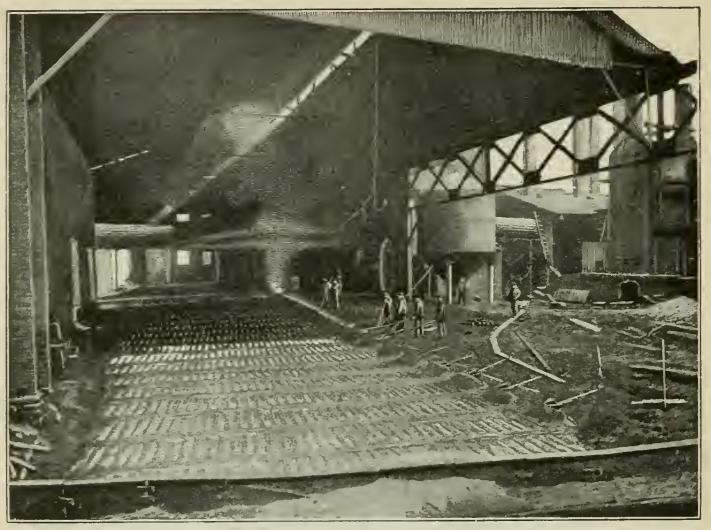


A Blast Furnace.

opened. See the golden stream flow forth. It flows out like a little river into a ditch or trough of sand.

The slag or impurities of the iron are on top. They are lighter than the iron, and they rise just as wood rises to the top of water. When the stream gets about twenty feet away from the furnace there is a little dam, which makes the top scum flow off to one side, and allows the iron to flow out below through a hole under the dam along another little canal in the sand.

The iron is now of a yellow color. It has lost the copper tinge which it had when it came from the furnace. It runs off in golden streams into a bed of sand in which little holes have been molded, so that the bed looks for all the world like a garden ready for planting. The holes are about the size and shape of what is known as an iron pig,



Making Pig Iron.

which is a piece of metal about as big as a stick of stove wood. The yellow stream flows into them, and the garden is soon full of these bright yellow pigs, which turn to a darker tint as they cool, and then change to the gray of cold pig iron.

Let us go a little nearer the garden. We can see the heat waves dancing over the hot iron, and we hold our hats before our faces to keep from being scorched. Still the furnace men move about, turning the fiery stream this way and that, and making it reach every part of the garden. Some of them are bare to the waist, and beads of sweat stand out like pearls on their white skins. They drink great quantities of water, and perspire freely, for if they did not perspire the heat is so great that they would be overcome by it and die.

When the iron grows cold, the pigs are dragged out of the sand and piled up, ready to be shipped to different parts of the country, or for use at home for the making of steel and all kinds of iron manufactures.

The slag goes to waste. It is poured out into a big iron pot fastened on car wheels. When this pot is filled with the fiery, boiling slag, men pull it over a railroad track some distance away, and empty it out upon the slag heap.

All iron ore has to be turned into pig iron before it can be used for manufacturing. Pittsburg has become a great city largely from its manufacture of pig iron and steel. We learn that we are now making more pig iron and steel than any other country in the world, and that our product is rapidly increasing.

We spend some days at Pittsburg, visiting the foundries and studying the wonderful processes of turning iron into steel. We see men making the steel rails for the railroads, watch them manufacturing the thick armor plate of steel which is to be used to protect the hulls of our war vessels from the cannon of the enemy, and observe the countless other things which are here turned out of iron and steel.

At Pittsburg we are at the head of navigation of the Ohio River. Here the Allegheny and Monongahela rivers unite, forming the broad Ohio, which flows for nine hundred and seventy-five miles to the southwest, until its waters mix with those of the upper Mississippi and go onward to the Gulf of Mexico. This makes a splendid waterway through the Ohio Valley, one of the most fertile parts of the whole Mississippi system.

We can get steamers almost any day to go down the Ohio. The river is quite as full of shipping as the Mis-

sissippi. There are fewer lumber rafts, but a great many more boats loaded with coal. The country is much more hilly than that through which we traveled on our way up from New Orleans. We notice that the farms along the banks are much smaller and better cultivated, and that there are more cities and towns.

We sail by town after town, above which rise the smoke-stacks of iron, steel, glass, and other factories. At Steubenville and East Liverpool we see men making beautiful china and pottery ware, and farther south, at Wheeling and Bellaire, we visit factories in which glass bottles and nails are made in vast quantities. There are other factories of various kinds here and at other points farther south, and we learn that almost every city of this middle

Cincinnati Music Hall.

section north of the Ohio has factories of one kind or another.

We float farther down the river to Cincinnati. Here there are so many factories and foundries that the city almost rivals Pittsburg. Cincinnati has about eight thousand manufacturing establishments, in which about one hundred thousand hands are employed. It has many railroads, and its location on the Ohio and at the southern end of the Miami Canal, which connects it with Lake Erie, gives it fine facilities for transportation by water.

We visit the beautiful residence section on the hills, some distance back from the river, take a walk into Kentucky across the suspension bridge which has been here built over the Ohio, and then, going back to our boat, sail on down the river to Louisville. Here we visit the great tobacco markets and tobacco factories for which the city is noted. Louisville is situated at the upper end of the Falls of the Ohio, but a canal has been built around the falls so that we might continue our boat ride on the Ohio down into the Mississippi; but we decide to go northward instead. Three hours by rail lands us in the thriving railroad, commercial, and manufacturing city of Indianapolis, the capital of Indiana. Here we spend a few hours, and then take the cars for Chicago.

XXX. THE GREATEST LAKE PORT IN THE WORLD.

CHICAGO, at the head of Lake Michigan, is now the second city of the United States. It has a population of about two millions, and people who live there think it will soon be greater than New York and that it may in

course of time surpass London. Indeed, Chicago grows so fast that if you would know exactly how many people it has you would have to take a new census every month. It is not an old city. It was founded about 1830, starting with a few huts in a swamp. Seven years later it had four thousand people, and its inhabitants called it a city. The idea of there being a city in such a place seemed ridiculous indeed to many, and the other cities of the United States laughed at the conceit of little Chicago.

The Chicagoans, however, went bravely on, and in twenty years its population had risen to ninety thousand. The citizens then began to show the great enterprise and

Lake Front, Chicago.

push for which they have always been noted. The ground was so swampy that no cellars could be dug on account

of the water. They decided to lift the city up above the swamps and give it a solid foundation. So the people propped the houses up on stilts; they brought in ground from the surrounding country, and raised the streets at least ten feet, elevating, as it were, the whole city.

Was not that a wonderful feat?

Yes; but this was only the beginning of Chicago's enterprise. The city has gone on doing wonders in the way of improvements from that day to this. It is now one of the best built and most beautiful cities of our land. Its people are still noted for their energy. They are said to work faster and do more than the people of any other city in the world. Every one is in a hurry, and the bustle of Chicago is greater than that of New York.

Have you ever heard of the great Chicago fire, which burned the city to the ground in 1871? Chicago then contained three hundred thousand inhabitants. It was, like all new cities, made up of fine buildings of stone and brick, stores and houses of wood, and rickety shanties, all mixed together. Then, one windy night, Mrs. O'Leary, an Irishwoman living in the city, went to the stable to milk her cow. It was dark, and she took a lamp with her. The cow kicked over the lamp, and started the blaze which burned the business part of the city to the ground, and destroyed millions upon millions of dollars' worth of property. The kick was a very expensive one, but it was a good thing for Chicago, after all.

The people did not wait until the bricks of the burning city were cold before they began to rebuild, and the houses which they then erected were put up to stay. Even New York has not more substantial buildings than the best business blocks of Chicago. They are huge stone and brick structures from ten to twenty stories high, and

as far as possible fireproof. The insides of these buildings are made of steel. The steel framework is entirely independent of the walls, and the business part of Chicago is, in fact, a city of iron buildings incased in walls of stone.

But how can they build such heavy structures in a swamp? The people failed many times before they succeeded in getting good foundations. At first great tree trunks, or piles, were driven down into the ground, and the buildings were constructed upon them, as is done in the cities of Holland. But it was found that the big buildings settled unevenly, and the people feared they would topple over and fall.

Then some one solved the problem by making a foundation of steel and concrete. The surface to be built upon was first covered with rails of steel such as are used for railroad tracks. These were placed side by side, and in the spaces between them a mixture of cement and sand called concrete was laid. The concrete hardened almost as soon as it was put down. Then another layer of rails was placed crosswise on top of the first, and concrete was spread upon it. A third layer followed, and so on until the builders thought the structure would support the great weight of the building which was to rest upon it.

Chicago is the greatest lake port in the world. Its growth is due to its situation at the head of Lake Michigan. It is at just the point where goods can most easily be shipped to and from all parts of the Mississippi River and its tributaries, and where it can distribute the grain and other products which come from the West.

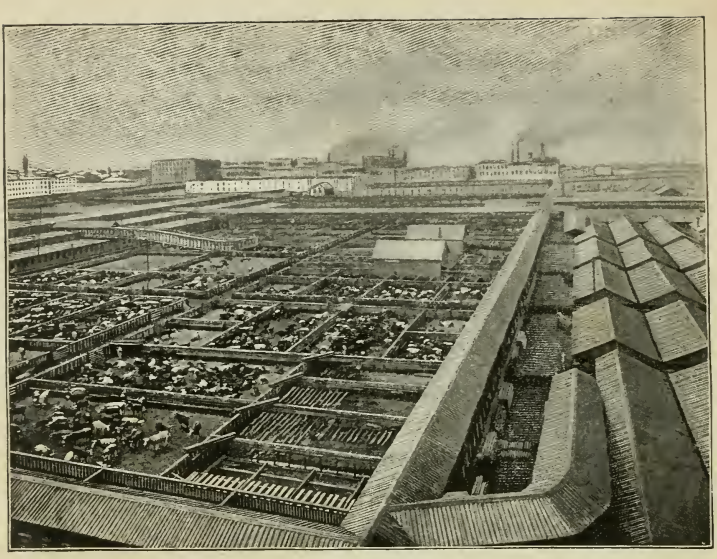
The plains about Chicago are very rich. The vast coal fields of the central part of our country are just south of it, and it is within easy reach of the Appalachian coal mines; iron can be cheaply brought from Lake Superior

down through Lake Michigan; and all around and about it are the wheat lands and the enormous cornfields of the United States. The result is that here has grown up one of the greatest commercial and manufacturing cities of the world.

We see the smoke of its factories as we near the city, and as we enter it we pass through shady suburban villages, out of which rise manufacturing works of all kinds. There are enormous steel foundries, there are iron works, and there are immense shops in which all kinds of wood-working goes on. Chicago is the largest lumber market in the world, and it makes all kinds of planed lumber and such things as window sashes and doors. It turns out a vast amount of furniture, and, indeed, of almost everything into which wood can be made.

At Pullman, one of the suburbs, there is a little city where people do nothing else but make cars of all kinds, from box cars for freight to the elegant sleeping coaches in which we have been riding over the country. Chicago has mighty elevators and great flouring mills, and it is noted for its stock yards, filled with thousands of animals that are shipped here to be killed and manufactured into meat products for all parts of the world.

The stock yards are one of the most interesting sights in the United States. Chicago is the chief meat-packing center of the world. Almost one third of all the meat provision business west of the Alleghanies is done here. Day and night, and every hour of the day, cars start out from Chicago, carrying beef, pork, and mutton to all parts of the United States and to Europe; and the cattle which we see this morning will a few days later be on the breakfast tables of the people of New York, Washington, and other cities and towns.



The Stock Yards.

But let us take a look at the stock yards. They are located almost in the center of Chicago, although they are quite far off from the business part of the city. We can go to them on the street cars for five cents.

As we approach the yards we hear the lowing of cows, the grunting of thousands of hogs, and the bleating of vast numbers of sheep. There are usually one hundred and sixty thousand animals in these yards, and the animals are changed every day. In one year more than ten million sheep, hogs, and cattle pass through these pens.

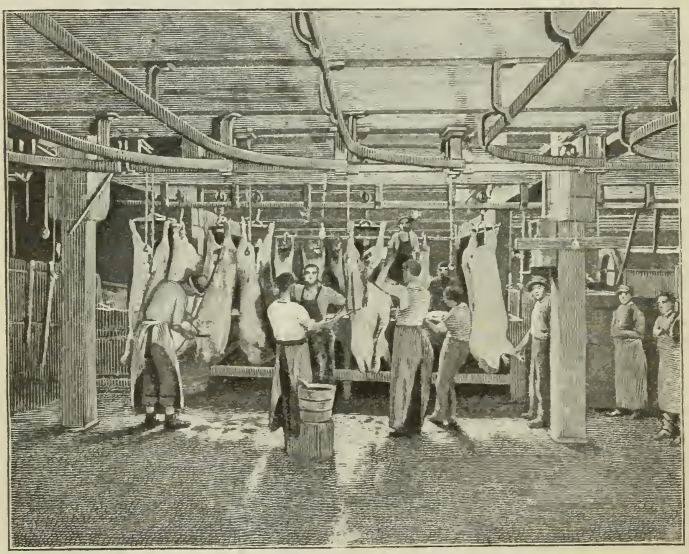
The stock yards make us think of a city—a city of animals within a city of men. Railroad tracks lead to it, there are great factories about it, and the houses of the city of animals are merely covered and uncovered pens.

The pens are arranged along streets which cross one another at right angles. There are sections and wards, and each section has its own kind of animals. Here is one which is devoted to cattle, the pens each holding from two to three hundred cows. Many of the pens have no roofs, and we can see the cows through the boards. There is a ward filled with sheep. There are enough little lambs there to supply all the Marys in our town. How the white, woolly creatures bleat and baa as we go by them! There is the hog ward, containing tens of thousands of grunters.

Look into the pens. Each of them has a long trough for water, and another for food. There are twenty-five miles of these water troughs in the city, and the feeding troughs, if put end to end, would reach fifty miles. The water comes from artesian wells which have been sunk twelve hundred feet down into the ground, and which gather their water supplies from below the bed of Lake Michigan. Through the streets of this animal city there are railroad tracks for the cars which bring in the animals and take them off to be slaughtered. There is a canal at one side of the yard, upon which are boats for carrying animals from and to the lake.

But what are those immense buildings in the center of this city of animals? That is the Exchange Hall, where the rulers of the city live, and where men come to buy and sell the four-footed citizens. The officials are tyrants. They are the most bloodthirsty rulers any city ever knew. They fill the yards with new animals day after day, only to kill them; and those great buildings which surround the yards are the slaughterhouses or meat-packing establishments, in which the beeves, hogs, and sheep are turned into food and other things for the use of man.

Let us visit the packing houses. They are more like great factories than the slaughterhouses of our villages. We follow the hogs. They go in alive at one end, and never stop until they come out at the other in the shape of hams, bacon, sausage, lard, buttons, and hairbrushes. We find that every part of each animal is saved, and the



Interior of a Packing House.

butchers tell us that they can sell, in some shape or other, every bit of the hog but his squeal. It is the same with other animals, and scarcely an atom of a cow, sheep, or pig goes to waste.

Even the bones of the animals are sorted, and manufactured into various articles. The skull bones, the jawbones, and the teeth are used by bone burners and bone grinders;

the hip bones, horns, and shoulder bones are turned into hairpins, ladies' combs, and buttons; and the bones of the thigh are used for the handles of toothbrushes. The bones are cooked before they are sold, in order that the marrow and juice may be gotten out of them for making glue. The hoofs are also used for making glue and grease.

The blood is sold as a fertilizer. The hides go to the tanners, the wool being pulled from the sheepskins, and the skins afterwards used for making gloves. The bristles of the hog are made into brushes.

The brains are used for food. Some parts of the beef are made into medicines, beef extracts, and beef tonics. Other parts are canned and turned into soups, and out of the refuse come candles, soap, and a variety of other things.

We might spend weeks in Chicago and not see all its wonders. We get some idea of the city by visiting the vast business houses on State Street and Wabash Avenue, or in going along La Salle Street and through the busy thoroughfares which were named after Presidents Washington, Madison, Jefferson, and Adams. We do not wonder that Chicago people are proud of their city; and our guide tells us how even the children boast of the town, and how one Chicago boy, not long ago, walking upon these same streets, asked his papa how it came that all the Presidents of the United States had been named after the streets of Chicago.

Chicago is a delightful place for children. Lake Michigan is full of fish which are said to be not only willing, but anxious, to be caught. The entire lake front of the city, for a distance of about twenty miles, is protected by a line of breakwater, over which, in the fishing season, thousands of boys and sometimes women and girls may be seen with rods and lines trying to catch fish.

Then there are boat rides on the lakes, and there is bicycling on the boulevards, which are as smooth as a

On the Boulevard, Chicago.

floor. Chicago has a wonderful system of parks, in one of which an electrical fountain plays for three evenings every week. It has many public libraries, and one of the biggest purchases of books ever known was made by the Chicago University, when three hundred thousand volumes were bought at one time.

We have, however, but a short time to spend in this wonderful city, and so, after a visit to the Field Museum and a few other institutions, we take the cars for our long journey across the plains and over the Rocky Mountains.

XXXI. THE WONDERS AND TREASURES OF THE ROCKY MOUNTAIN REGION.

THE Rocky Mountains form what might be called the roof of the North American continent. As we travel westward from Chicago, we soon reach the Mississippi River in the midst of the wheat and corn regions, and then for one thousand miles we rise steadily upward, as we cross the great plains, before we come to the foot of the Rocky Mountains at Denver. Denver, although at the foot of the mountains, is higher than the top of Mount Washington. The summit of Pikes Peak, which we see as we near the end of our railroad ride, is almost two miles higher than Denver, and nearly three miles above the level of Washington, New York, or New Orleans.

Pikes Peak is one of the highest of the Rocky Mountains. It was named after Major Zebulon Pike, who tried to climb it more than ninety years ago, but was obliged to turn back, sadly remarking that nothing but a bird could reach its snowy summit.

But we shall reach the top of Pikes Peak, and we shall ride there at our ease in the cars. A railroad has been built up this mighty mountain. The road is much like that over which we traveled to the top of Mount Washington. The little steam engine pushes us up, up, up, until we at last step out of the car at a height of almost three miles above the sea. Near the top, patches of snow usually may be found even in summer.

As we stand upon it, we see the wonderful panorama of the mountains and valleys. Stretching to the eastward are the great plains, dotted with villages and cities, through which we have just passed. They are merely specks on

The Garden of the Gods.

the landscape. The Garden of the Gods at our feet, which is really a valley filled with vast rock formations, looks like a flower bed. To the west, as far as we can see, rise hill upon hill and mountain upon mountain, and these in most places look like piles of rocks of gigantic size, thrown together in all sorts of shapes.

As we stand here, the clouds float about below us. Now they sweep upward, and for a time we are enveloped in mist. Now there is a thunderstorm far down the mountain side. The lightning seems to flash against the rocks, and we can hear the deep roll of the thunder as the clouds burst in the mountains.

The region of the Rockies is the wonderland of America. There is no other place in the world where one can see so many marvelous things. We shall there find waterfalls higher than Niagara, deserts almost as dry and dreary as the Sahara in Africa, great forests of trees which have been

turned into stone, and other forests whose trees are so big that you could cut out a very large schoolroom inside of one of their trunks, and have room to spare.

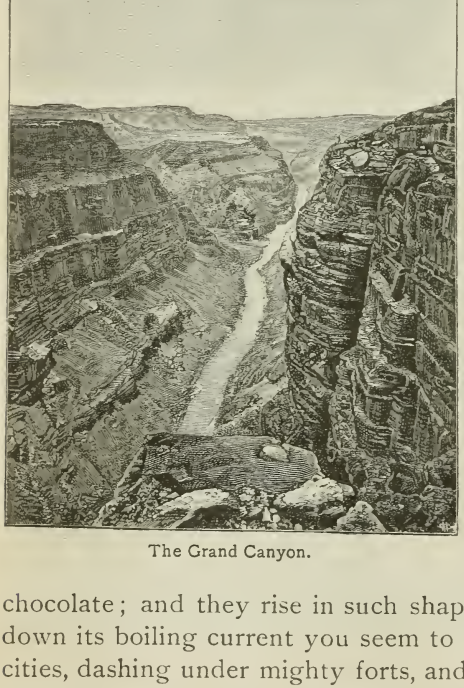
In the northern part of this great mountain region, in Alaska, there are glaciers far more wonderful than those of the Alps; and in the southern part are the mighty volcanoes of Mexico, which vomit forth lava, sulphur, and red-hot stones.

Within a radius of five hundred miles of Pikes Peak lie three of the greatest of the natural wonders of the Rocky Mountains. If we travel to the northwest, we shall find

Scene in Yellowstone Park.

ourselves amid the hot springs and geysers of the Yellowstone Park; almost directly west, and at about the same distance, is found the Dead Sea of America, the Great Salt Lake of Utah; and farther south is the Grand Canyon of the Colorado, the most wonderful river bed known to man.

The Colorado River comes from the snow regions of the mountain peaks. It burrows its way, as it were, down through the high plains, cutting out a trough, or gorge, which is in one place more than a mile deep, until it at last flows into the Gulf of California.



The Grand Canyon.

The Colorado River is in places a mad, raging torrent. It has numerous falls and many rapids, and the scenery about it is wonderful beyond description. The great walls of rock upon each side of it are colored in the highest tints of red, yellow, gray, and chocolate; and they rise in such shapes that as you float down its boiling current you seem to be passing by great cities, dashing under mighty forts, and flying by immense cathedrals. The cliffs above you are a mile high. At times the clouds gather over the top of the gorge, and you float along in darkness. Then the clouds break, and the clear blue sky shows through.

The region about the Colorado River contains much desert land, where there are many rocks, but little vegetation except sagebrush and cactus. This is the character of

a great part of the Rocky Mountain Region. We find rocks of all kinds piled together in cliffs thousands of feet high, or cut down into canyons thousands of feet deep. There are hills of rock, mountains of rock, valleys which are rocky deserts, and rocky plateaus upon which we might travel for several days without finding water.

This is all very wonderful, is it not?

Yes; but after a while, when we visit the Yellowstone Park, we shall find something much more wonderful.

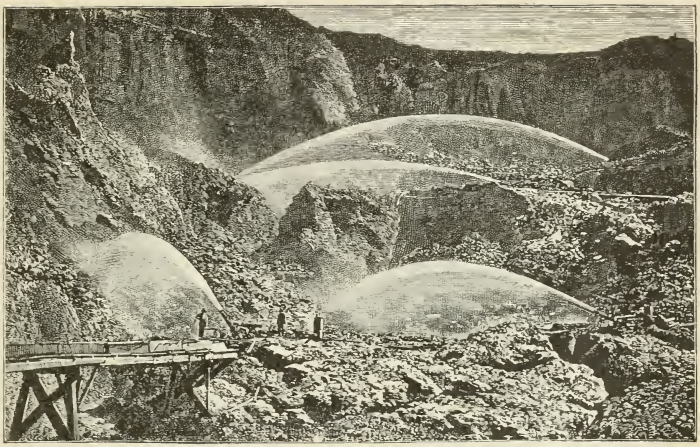
We shall see strange things almost everywhere above ground in this curious region, and by going down into the earth may visit gold and silver mines such as can be found nowhere else in the world. You may have read in the "Arabian Nights" about the cave of Aladdin, which was filled with gold, silver, and precious stones. That cave existed only in the mind of the man who wrote the story. The treasure vaults we are to visit to-day are real treasure vaults.

From their beginning about the Yukon River in Alaska, down through the western part of the North American continent to the Isthmus of Panama, these wonderful mountains contain veins and beds of gold and silver. Not far from Pikes Peak, rocks are sometimes dug up which are so full of gold that if you roast them the precious metal will bubble out and stand up like little golden pinheads upon the dark stone. About Leadville, in Colorado, gold is found in one mine in the form of thin sheets and plates, squeezed in between the rocks; and in the Sierra Nevada there are vast bodies of white quartz with little veins of gold running through them. The gold is sometimes so mixed with the rock that it has to be ground to powder and chemically treated before it can be gotten out, and the rock itself is often melted to extract the gold.

The first gold found in the West was that taken from the rivers. The sand of many of the mountain streams is mixed with gold dust, or grains and lumps of gold. In 1848 James Marshall, while digging a race for a saw-mill on the banks of the American River in California, found some bits of yellow metal which turned out to be gold. The news spread, and within nine months from that time there were thousands of miners washing the dirt along the banks of the California rivers. In less than a year more than five million dollars' worth of gold had been dug up; and within four years more than two hundred million dollars' worth had been washed out of the streams of the Sierra Nevada. Men from all parts of the world rushed to California.

Then gold was found in the mountains farther to the eastward; and it is now known that there are gold and silver in every one of the states and territories of this region. Since that time more than two billion dollars' worth of gold, and more than one billion dollars' worth of silver, have been dug out of the Rockies. Hundreds of towns have sprung up to accommodate the miners, and the great cities of Denver and San Francisco were largely built by such means.

After a short time the miners were not satisfied with washing out the gold in pans and in little troughs, or cradles. They conducted the streams from the mountains to the mines and sent great streams of water through hose against the sides of the mountains to wash down the gold-bearing gravels. This is called hydraulic mining. They built flumes, or troughs, into which they turned the mountain streams. On the bottoms of the troughs, sticks were nailed, and quicksilver placed there. Then the precious dirt was thrown in. The water washed away the mud, but



Hydraulic Mining.

allowed the grains and dust of gold to fall to the bottom, to be swallowed up by the quicksilver, which dissolves pure gold and gathers it into itself as water does sugar.

But all this loose gold comes from the wearing away of the rocks in which the gold is; and the miners soon began to hunt for the rocks themselves, to drag them out of the mountains, and to crush them to get the gold out. It is from such mining that the most of our gold now comes.

XXXII. A VISIT TO A GOLD MINE.

TO-DAY we shall first go down into one of the great gold mines of Colorado, and see something of the enormous work it takes to get this precious ore out of the earth. Then we shall follow the ore to the mill, and see how the gold is taken out of the rock with which it is mixed.

Our mine is situated high up in the mountains, more than two miles above the sea, and not far from Pikes Peak. As we ride up to it on our donkeys, we wonder how the miners could tell there was any gold there, and we pass on the way hundreds of holes which have been dug by men who have failed to find gold. Gold, as you know, does not exist everywhere, and it is only when veins of rich gold-bearing rock are discovered that it pays to sink mines.

At last we come to the mine. The buildings above it look more like a big factory than anything else. There is an immense steam engine, and hoisting machinery to lift the cars of ore up out of the ground. The great building is known as the shaft house, and the hole which goes down into the mine is called the shaft. The shaft of this mine is about eight feet square, and almost as deep as the height of the Washington Monument. Elevators are always moving up and down it, bringing out the rock which contains the gold. We can jump on the elevator and go down into the mine. The shaft is sunk just at the side of the vein of gold-bearing rock, and from it tunnels are dug off here and there to get out the ore.

Each tunnel has a little railroad in it, and the golden rock is loaded into iron cars each about the size of a dry-goods box. Each car will hold about a ton of ore, and when it is filled it is pushed upon the elevator, and a signal to the engineer brings it to the top.

A car is being taken off as we reach the shaft house, and the manager of the mine directs us to step on the elevator. He signals to the engineer, and we start downward into the mine. Within a few seconds we are far below the surface. The shaft is filled with a darkness so dense we can almost feel it. We huddle close together, and drop sixty-five feet before we come to the first level.

Here we see a score of dirty miners, each holding a candle, the light of which makes him look almost ghostlike against the darkness of the tunnel at the back. The miners have a carload of ore which they want to send to the top. We go down to another level sixty-five feet below this, where another great tunnel has been cut out in the mountains; and at last, at the fifth tunnel, three hundred feet below the top of the mine, we leave the elevator.

Elevator in Mine.

The miners lend us their candles, and, as we walk along, the manager shows us the vein of rock which contains the gold. It looks just like slate, and it seems to be a sandwich of slate between walls of other rock running slanting down into the earth. How far down it goes no one can tell. The tunnels are pipes of rock cut, as it were, out of the golden meat of the sandwich.

As we go through the tunnel, we see how difficult it is to get out the ore. Here a miner works by the light of a tallow candle. He has a piece of steel as big around as a broomstick in his hand, and about as long. He is pounding it with a great hammer, moving it round and round, making a hole in the rock. Now he lays down his tools. He takes up what looks like a big candle, and sticks it into the hole. Notice how carefully he handles the candle. It is well he does so, for that candle is dynamite, and

should it go off now it would blow us all to pieces. He is using it to blast down the rock. Now he connects a fuse with it, and packs the earth tightly in about it. Now he lights the fuse, and the manager tells us to run. We do so, and just reach a side tunnel when a terrible explosion occurs. The very earth seems to shake, and the air is blown so that our candles go out, although we are now a quarter of a mile away. We hear the rock fall, and, going back, find the miners digging it out with picks, and throwing it into holes in the bottom of the tunnel. It falls through these into the cars in the tunnel below.

The ore, as it is loaded upon the car, looks for all the world like pieces of ordinary rock; we can see no signs of gold about it; and still each ton of rock contains so much gold that it is worth from ten dollars to several hundred dollars. Some parts of the vein are much richer than others, and some ore is so valuable that it is put in sacks by itself, a little half-bushel sack being worth as much as ten thousand dollars.

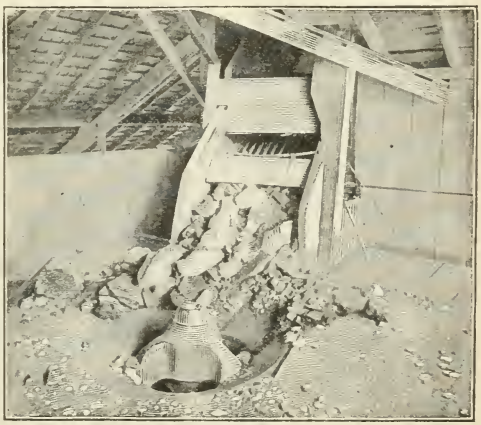
The different kinds of ore need different treatments to get the gold out. The very rich ore goes to the smelters, where it is put into furnaces, with other materials, and so melted that the gold is extracted. Other kinds of ore are treated by chemicals and gases in different ways; and much of the rock which is of a low grade—that is, which contains only small quantities of gold—is sent to the cyanide mills. Here it goes through a comparatively new process, by means of which every bit of gold is extracted. This process is a very important one.

Let us go to the top of the shaft, and ride on one of the cars of ore to the cyanide mill. Our car is piled with broken stones of different colors. There is gravel in it. Pick up a piece of rock from any part of the carload on

which we are sitting. You might put it under a microscope, and you could not see a glint of yellow, or anything which to your eyes would indicate gold. Still, that rock will average half an ounce, or about ten dollars' worth, of gold to the ton. In those carloads one atom in many, many thousand is gold, but this atom is almost evenly mixed throughout the whole. The question is to get it out.

The superintendent of the works tells us this as we ride on the cars up to the mill. The engine drags our car over a trestlework track to the top of the mill, for the rock is carried from one level to another by means of gravity.

We look down at the load as we go up. There are specks of stone the size of the head of a pin, and there are immense bowlders, weighing hundreds of pounds. All this must be crushed to powder before it can be worked.



Rock Crusher.

The car stops at the top, and the ore is loaded into what looks like a gigantic coffee mill, the top of which is as big around as a hogshead. As the rock falls into it, the mill seizes the stones in its great steel teeth and grinds them to pieces. We imagine we hear them groan as they are crushed, and we shud-

der at the thought of getting into the jaws of the machinery. This mill grinds the ore to the size of a walnut. Another takes it and reduces it to pieces the size of a pea, and it is then ready for the drier.

Every molecule of moisture must be taken out of the ore before it can be ground to powder. This is done by passing it through enormous steel tubes fifty feet long and as big around as a flour barrel. Through these tubes flames of gas continually blow, and the heat takes all the moisture out of the rock.

Then an elevator of iron buckets, much like that we saw in the flour mill, carries the ore to the top of the works, and it is emptied into steel crushers, which grind it to powder. The ore which we saw before as cobblestones and broken rock has now become a flour. It looks like dust, but each grain of it contains a little bit of gold, and this costly dust is worth a fortune. The rock was hard and rough. The dust is so soft and fine you can rub it to and fro in your hands without scratching the skin, and it looks much like powdered pumice stone. It has, however, no gleam of gold, and were it on the road you would walk over it without thinking.

Now out of each of those grains of dust the gold is to be taken. This will be done by giving them a bath in a solution of cyanide of potassium and water. Cyanide of potassium is a chemical which looks like alum. When dissolved in water it has such an attraction for gold that if there is any gold in anything which it touches, the gold will melt into the fluid and become a part of it, just as sugar or salt goes into water. The dust with the gold in it is put into circular tanks of steel, each about as high as your waist and so large around that you could not get one of them into an ordinary schoolroom. Then the

water containing the cyanide is let in. We can see it flowing down out of the pipes into the golden flour. It looks just like water; but if you should taste it, it would kill you, for the cyanide makes it deadly poisonous. As the stuff runs through the flour, it makes it look like a great pot of brown mush or mud. It would make good mud pies; but it is mud mixed with gold. As the cyanide water goes through it, the gold leaves the mud and passes into the water, which is then drawn off through the bottom of the tank. There is some of it now flowing through that trough. It does not look as though there was gold in it, but there is, and if we follow it into the room below, we can see how the gold is gotten out of the water.

This is done by means of the attraction the gold has for zinc. We have seen how fond gold is of cyanide. We now find that it likes zinc even better. The golden water

Prospecting for Gold.

is run into boxes filled with shavings of zinc, much like the excelsior we use for packing. As the water touches these shavings, the gold leaves it and sticks to the zinc; and when the water again passes out, all of the gold is left. The shavings are now washed to get off the gold; and the dirty zinc and gold is so melted in a furnace that when the mouth of the furnace is opened, a golden stream pours forth, which, being run into a mold, soon hardens into a brick of gold more pure than the finest wedding ring.

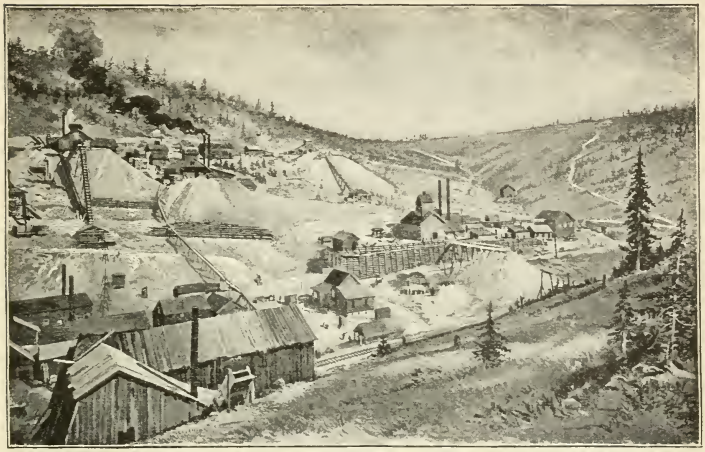
We find gold-mining camps almost everywhere as we travel through the Rockies; and away off in the mountains, hundreds of miles from any cities, we see men going from place to place, digging, or prospecting, for gold.

XXXIII. A DAY IN A SILVER MINE.

YESTERDAY we spent in the depths of the earth, surrounded by gold. To-day we are to visit one of the greatest silver mines of our country. The United States produces more silver than any other country in the world, and there are mining cities in the Rockies which are built above beds of silver-bearing rock, and in which paying mines might be sunk by digging under the principal streets. This is the case with Leadville, Colorado, which is in one of the chief silver regions of the country.

The mine we shall enter to-day is much farther west. It is the famous Ontario Mine, situated in the Wasatch Mountains, near Park City, Utah, which has already produced more than thirty million dollars' worth of silver.

We ride through the muddy streets of Park City, up the narrow gulch behind it, past great works which are crush-



Mining District — Leadville.

ing the ore to extract the silver, and on up to the big barnlike buildings which contain the machinery for getting the ore out of the mine.

Here there is a shaft like that by which we descended into the gold mine. The silver, like the gold, is found in a great vein, or sandwich, of silver-bearing rock between walls of other rock. No one knows how far down into the earth this silver vein goes. The shaft which has been sunk beside it extends down about one third of a mile, and at levels one hundred feet apart tunnels have been dug out into the vein to extract the ore. Each of these tunnels is from four to six feet wide, and so high that we can walk through it without stooping. From the tunnels the miners have worked upward along the vein, digging out great caves and rooms in the mountain, all of which have to be walled and roofed with timbers to keep the earth from falling in.

A good idea of a silver mine might be gotten from a big New York apartment house. Take the Ontario, for instance. It has fifteen stories, each one hundred feet in height. In the shaft there is an elevator which a steam engine raises and lowers, carrying the ore and the men from story to story. At each story a tunnel runs off through the vein and connects with the rooms, or stopes, as they are called by the miners. The tunnels are the passageways or halls of the flats, and the stopes are rooms dug upward and outward in getting out the ore. Each tunnel has a little railroad running through it, and there are about fifty miles of such tunnels in the Ontario.

The cars of the railroad are of iron. They are always loaded by gravity. From the tunnel of each of these stories to the tunnel below it a pipe, or chute, has been cut at such an angle that the ore being shoveled into it will roll down and fall into the car placed at its mouth at the other end, one hundred feet below, thus saving the lifting of the heavy ore.

But the manager is ready to take us down into the mine. Two cars, each containing fifteen hundred pounds of silver ore, have just been wheeled off of the elevator, and we are told to step on.

As we do so, the manager gives a signal to the engineer, and we start down into the earth. We descend as fast as though we were in the elevator of a Chicago hotel, and drop at once into the darkness. We are warned to keep close within the cage, as a hand or a head might be taken off by a projecting timber. We hold on for dear life to the iron rail above us, and try to shrink ourselves inward as far as possible as we go down, down, down. Now we pass one of the levels, and catch a glimpse of a candle in the opening. Now our ears are dinned by the

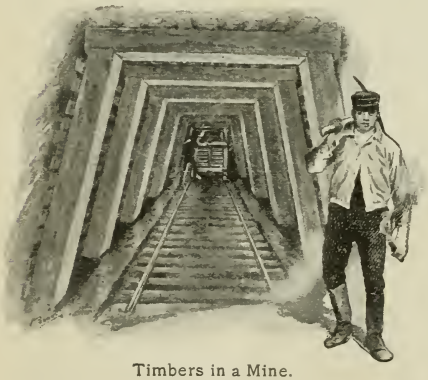
shooting of a blast, and the sound so shakes the air that our candles are blown out. We light them again when we fall to the next level, and the faces of the miners about us look weird and ghostlike in their flickering glare.

It makes us shudder, and we feel at times as though we were on the edge of the grave. We tremble when the elevator is stopped at the sixth level, and there, six hundred feet below the earth, a miner steps on with a box of dynamite candles. It is no bigger than a soap box. It cannot be more than two feet square, but it has enough dynamite in it to blow up the Capitol at Washington. There is no top to the box, and as the miner places it close to our feet, we think of the terrible possibilities. Suppose a rock should drop from the top down upon that dynamite! Suppose a spark from a candle or a bit of wick should fall into it! We can feel our hair rising and our faces whiten. We ask as to the danger, and are told that it is comparatively small, but that the box contains forty per cent. of nitroglycerin. We feel much relieved, however, when it is taken away.

And so we go on down to the bottom. As we descend we hear the rushing of water. Many of our silver mines are wet mines. The water has to be kept out of them, and vast works are necessary for this end. The Ontario is a wet mine, and among its waterworks is the famous Ontario Tunnel, which was built, at a cost of five hundred thousand dollars, to carry the water out of the mine. This tunnel is a subterranean passageway three miles in length, so wide that we could drive a buggy through it, and so high that we walk in it without stooping. The tunnel has a floor running through it. Upon this there is a railroad by which ore and men are carried from one part of the mine to another by mules.

As we walk over the road we hear the rushing of water, and look down between the boards. There is a torrent flowing under us. It comes from the mine at the rate of ten thousand gallons a minute, and as we listen, we hear the water falling, falling, as it comes from the levels above.

There was not an ounce of silver in the rock which was dug away to make this tunnel, and it gives us some idea of the cost of mining when we learn that this half-million dollars was spent for dead work, and solely to get the water away from the other parts of the mine.



Timbers in a Mine.

It is the water that necessitates the walling of the tunnels and the stopes with logs. The wet earth is always pressing in, and without timbers the mine would not last for an hour. The pressure is so great that it sometimes grinds the great pine logs to powder. Some of the highest-priced men employed in the mines are those who take care of the timbers, who walk through the mine daily, looking for weak spots. The best of timber is required, and that used in the Ontario Mine comes from the forests of Oregon.

And so we go along from tunnel to tunnel. Now we climb into one of the stopes, and watch the men at work. We have candles in our hands, and we crawl along, bending almost double, the water dripping down upon us. At last we enter a cave. Here a half-dozen miners are work-

ing. Some are taking the ore out with picks. Their wire candlesticks are stuck into the rocks beside them as they dig away at the pile of stone which has been blasted out by dynamite. Some are loading ore. They push it into the chutes with long-handled shovels, and we hear it roll down and strike the iron bottom of the car beneath.

In other places men are drilling in order to blast. They blow down the rock with dynamite just as the miners did in the gold mine we visited. There goes a blast now. Let us go to the scene of the explosion. The dynamite has torn the rock out of the earth, and a great mass of silver-bearing ore has been loosened from the sides of the mountain. As we stop, the miners show us the vein. It runs from six inches to forty feet in width, the average being fifteen feet, and in it we can see streaks of silver ore, some of which are three feet wide.

But let us follow the ore to the mill. It is put into the steel cars, raised to the surface, and carried in wagons to the immense frame buildings farther down the mountain. First it is run through a crusher, which chews the rocks between its teeth until they are ground into pebbles and fitted for the drier. The wet ore is dried much as we saw the gold rock roasted in the cyanide mill. It is next crushed to a flour with heavy steel stamps, and then mixed with salt, and roasted again in such a way as to prepare it for the quicksilver, which, as we shall see later on, sucks the silver out of the ore flour.

After being roasted, the hot ore flour is left piled up on the floor of the furnace room for a time. We see several such piles there as we go in. They look like piles of sand, and we feel tempted to jump into them, when the manager pulls us back, and tells one of the men to stir up a pile with a shovel. He does so, and we see that only the

outside is yellow. Under the thin coating the ore is red-hot, and had we jumped into it our legs would have been roasted.

The process by which the quicksilver takes the silver out of the ore makes one think of the prince in the fairy tale, who broke through the hedge and kissed into life the princess who had been sleeping for a hundred years. It is the quicksilver prince, in fact, who kisses the sleeping silver-ore maiden into life, and carries her away from the palace of rock in which she has been locked for ages. After the sand has cooled, it is carried into what is known

Interior of a Silver Mill.

as the pan room, and is thrown into great pans of iron, each of which holds about three thousand pounds. Water is introduced, and this turns the ore sand to a thick brown mush.

Now into each of the pans, through a little pipe, are

poured three pounds of quicksilver, and stirring machinery is set to work, which moves about through the ore, mixing the quicksilver with it. The sand was warm, and the quicksilver by the warmth becomes active, and by the mixing divides into drops as big as the point of a pin. The mixers move about at the rate of sixty revolutions a minute, and send these little quicksilver drops through the sand. As they go they seek out the particles of silver, and as each drop of quicksilver touches an atom of silver it sucks it into itself. This traveling of the quicksilver is kept up for eight hours, at the end of which time all of the silver in the sand has been absorbed by the quicksilver.

The two metals have united, and the marriage is complete. The quicksilver is now drawn off, and you have a bucketful or so of quicksilver containing the silver. But man cannot use quicksilver and silver mixed together. The quicksilver-and-silver mixture is now put into a furnace, which is so tightly sealed up that not even vapor can get out of it, except by means of a pipe at one end. Then the fire below is made hotter and hotter until at last the quicksilver, which turns to vapor at two hundred and sixty degrees of heat, rises up in the form of vapor. It flows off into the pipe, and is condensed farther on by cool water passing over the pipe, and is thus saved.

The pure silver does not vaporize at all. After the quicksilver has left it, it is allowed to cool; and when the furnace is opened, it is found on the bottom, looking for all the world like a piece of old plank covered with ashes. It is now silver slag, or impure silver bullion, and is ready to be shipped to the refining furnaces in other parts of the country, where, by means of chemicals, it is made pure and fitted to go to the mint to become silver dollars.

XXXIV. ACROSS THE ROCKIES TO SALT LAKE.

THE trip from Denver to San Francisco requires about thirty-six hours of fast railroad travel. We find the journey far different from those we took in the eastern part of our country. The railroads climb right over the

Railroad over the Mountains.

Rocky Mountains. We wind about one curve after another, through great gorges where the cliffs seem about to fall down upon us, climbing always upward, until at one place we reach a pass where we are two miles above the sea. Now everything is dry and rocky and thirsty-looking. The air is so clear that we can see for miles, and so pure that we drink in deep breaths of it. In climbing the mountains, we find that we have to stop every few moments to breathe. Some of us feel faint and sick from the

rarity of the air. We learn that some people are always attacked by the mountain sickness at this altitude. I have seen people faint away in going over Marshall Pass, on the Denver and Rio Grande Railroad.

We ride for miles without being out of sight of snow. Snow lies on the tops of the mountains all the year round. In the winter it falls in such quantities that the drifts cover the railroad tracks; hence miles of snowsheds have been built over the tracks around the sides of the mountains, in order to keep the snow from stopping the cars. Going through these sheds is much like going through a big tunnel, except that, here and there, we pass a crack through which we can peep out and look down perhaps thousands of feet into the valleys below.

The scenery is wonderfully grand; but as we look at the country about us, from the rocky desert to the snow-clad

Mountains in Utah.

mountains, we wonder if this part of the United States can really be of much value. We remember, however, the mines of gold and silver, and are told that vast deposits of copper, lead, and other minerals are found here. We learn that where there is water large herds of cattle can be pastured upon the high plains, and that thousands of such beasts are turned out to graze, under the charge of herdsmen, who are sometimes called cowboys.

Vast flocks of sheep are pastured among the mountains. These flocks are watched by shepherds who live, with their sheep dogs, in covered wagons from one year's end to the other, while driving the sheep from place to place to find the best feeding grounds. As we see these wagons standing out on the plains, with nothing but the rocks, grass, and sky about them, it seems to us that such a life must be very lonesome. We ask if it is so, and are told that the shepherds sometimes go crazy for the want of company.

Prairie Dogs.

Now and then we pass prairie-dog villages—little hillocks, each of which has a hole leading into it to the nest where the prairie dogs live with their young. The prairie dogs are about the size of small rabbits. Some of them sit on their hind legs, on the tops of their little houses, and watch the cars as they go by, while others are frightened and scamper into their holes. We look in vain for the grizzly bear, deer, and mountain sheep. Such animals are seldom seen near the railroads, although

a few hours' walk from almost any of the stations will bring you to places where they can be found.

The country seems to grow more dusty and dreary as we travel farther westward, when all at once we come out of the desert into the green valley of the Great Salt Lake, and find ourselves in Salt Lake City, the capital of Utah.

There are few more beautiful towns than Salt Lake City. It lies in a valley, surrounded by mountains which, at the back of the town, rise more than a mile upward, their heads crowned with everlasting snow. A few miles away to the northwest lies the Great Salt Lake; and northward and southward, as far as we can see, is a green valley covered with meadows, orchards, vineyards, and gardens.

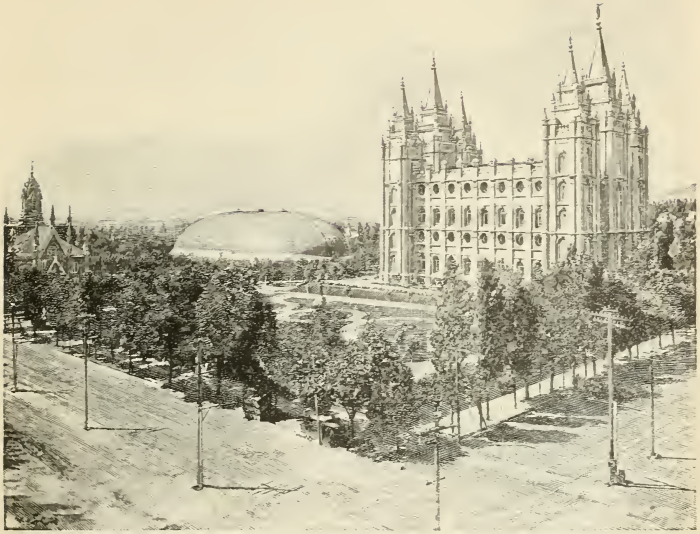
Salt Lake City.

Salt Lake City has very wide streets, shaded by great forest trees. Its houses have lawns, gardens, and orchards about them; and along the sides of each street a stream of mountain water flows. There are few poor buildings, and the city seems to us a prosperous place.

Salt Lake City was built by the Mormons, who, with their prophet Brigham Young as leader, long before the days of railroads, traveled over the plains and mountains, and picked out this spot for their city. The Mormons were a body of men who thought they had received a new revelation from God which they were to obey. Among other things, they believed that it was right for a man to have more than one wife; but as this is against the laws of the United States, they do not now practice this belief.

The Mormons laid out their city, dividing it into squares of ten acres each, and began to build the great structures of the Mormon Church which are now among the wonderful buildings of the world. The Mormon Temple, recently finished, is one of the grandest churches in this country. It is built of granite from quarries in the mountains near by. It covers more than an acre, and is one hundred feet high, with great towers, which rise up more than one hundred and twenty feet higher than the main building. The temple was almost forty years in building, and it has cost half as much as the Capitol at Washington. It is where the Mormons meet for some special observances of their religion, and outsiders cannot enter it.

Not far from the temple, we see the great building in which the Mormons worship every Sunday. It looks like an enormous bath tub, or the half of an eggshell set upon pillars. It is made entirely of iron, glass, and stone, with a roof of stamped copper. It is known as the tabernacle, and is open to all. The tabernacle has seats for nine



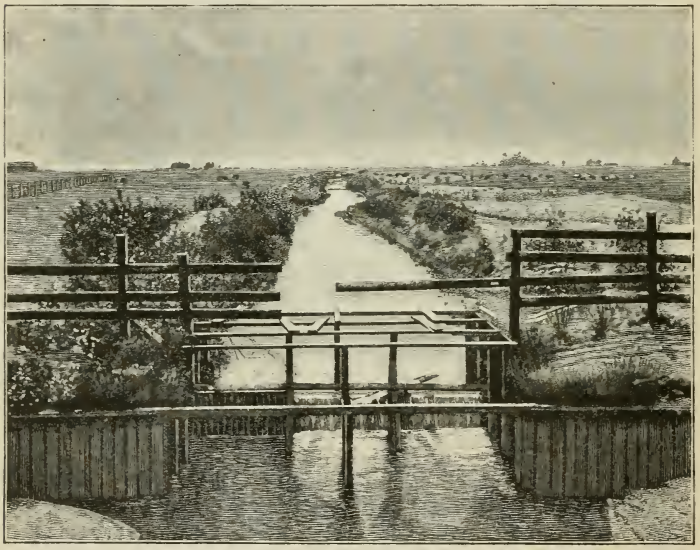
Mormon Temple and Tabernacle.

thousand people. Upon ordinary Sundays more than six thousand men, women, and children go to church there, and at many times the seats are all filled. The Mormons, who were very few at first, grew in numbers from year to year, and it is now estimated that there are more than two hundred thousand of them in Utah.

At the time the Mormons came here the Salt Lake Valley was almost all desert. They turned the streams of water out over the land, irrigating it, and thus transforming it into prosperous farms. As we travel through these regions, we shall learn that much of the desert will make the best farming land if it can only have water.

In many parts of our country there is so much water

that we do not stop to think what it is worth. In the far West men buy and sell water. There are thousands of farmers in Colorado, Utah, California, and other states who are glad to pay for the water which comes from the streams. There are irrigation companies, which spend



An Irrigation Canal.

vast sums to save the water and to carry it to the right points on the land. The water is sometimes dammed up in the mountains, being stored there in lakes, and only so much is allowed to go out at a time. Canals are built from the rivers out into the desert, and smaller canals lead off from these, covering the thirsty land with a network of little waterways within which all things will grow even more luxuriantly than in the countries where there is

more rain. Such watering of land is called irrigation. We shall see much of it in all the states of this region.

From Salt Lake City we can ride in less than an hour to the Great Salt Lake. This lake lies in the vast basin between the Wasatch Range and the Sierra Nevada. The basin has no outlet to either ocean, but part of its water flows into the Great Salt Lake.

This wonderful body of water is one hundred miles long, and its average width is from twenty-five to thirty miles. It lies right at the foot of the Wasatch Range, and is so bounded by mountains that streams of fresh water are always flowing into it; but, notwithstanding this, it is six times as salty as the waters of the ocean. It furnishes the most delightful salt-water bathing in the world, although it is more than a thousand miles away from either ocean. Any one can swim in it; for the salt makes the water so heavy that, if you were to tread your way out from the shore to where the water is fifty feet deep, you could not possibly sink, and your body, from the shoulders upward, would stick out of it like a cork on a fishing line.

The waters of the Great Salt Lake are so salty that thousands of tons of salt are made by evaporation along the shores of the lake; and there is so much soda in the water that, at one place near Salt Lake, a windy night never fails to pile up many tons of soda, washed there by the waves.

The Great Salt Lake contains so much salt that no fish and few other living things can exist in it. As we lie with our arms folded, floating upon it, we need not be afraid of a shark nipping off our legs; and as we tread through it, neither fish nor crabs will bite at our toes. We might fish here for years and never get a bite. Still, some of the streams that flow into the lake are full of delicious brook

Bathing in Great Salt Lake.

trout, and were we to follow the little river Jordan from its mouth in this lake up to its source at Utah Lake, we should find there one of the prettiest fresh-water lakes in America.

XXXV. THE FAIRYLAND OF CALIFORNIA.

LEAVING Salt Lake, we continue our ride over the dusty plains and great mountains. We cross the state of Nevada, noted chiefly for its silver and gold mines, into California, and then, shooting down the timbered sides of the Sierra Nevada, find ourselves at the city of Sacramento, in one of a series of valleys which make up a great part of the fairyland of California.

After our long and dusty ride over the rocky, thirsty

highlands, California is wonderfully refreshing. There is no section of the United States for which nature has done so much. There are parts of California in which it is summer all the year round. The flowers always bloom, and the trees are always green. In the city of Los Angeles they sometimes have a festival of roses to celebrate the New Year, and on Christmas morning you could there go out to the shore and take a bath in the ocean, come back and set the table for your Christmas dinner under the orange trees, and in the afternoon, by a short railroad ride, be up among the snows, under some of the finest Christmas trees in the world, on the tops of the mountains.

Our trip through California makes us think of Christmas, for we see again and again many of the very things we then find in our stockings. We travel through regions in which delicious English walnuts hang from the trees, and

Almond Trees in Bloom.

we see orchards loaded with almonds. There are oranges bigger and sweeter than those we ate in Florida. There are lemon trees by the thousands, and we ride for miles through vineyards of the choicest grapes. When we eat our mince pie or plum pudding at our next Christmas dinner, we may have some of the very raisins which we now see as grapes on the vines. We are surprised to learn that many of the raisin grapes are green in color. They are of the variety known as the white muscat, and they turn purple only when, having been cured in the sun, they become dried raisins.

A Rose Bush in California.

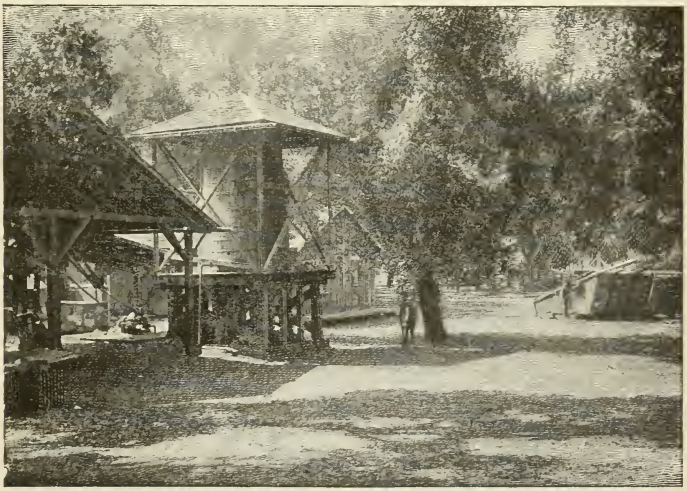
Do you like prunes?

California has thousands of trees on which they grow. Prunes are a species of plum, and they are far more delicious as they hang on the trees than when dried and packed away in boxes for sale.

We see olive groves here and there. Olive trees are knotty and gnarly. The fruit on them looks like green plums, and we make wry faces as we bite into it. Olives must be pickled before they are ready for eating. The fruit is gathered very carefully. Women and men, and sometimes boys and girls, do the picking. Some stretch out sheets under the trees, while others climb up the trunks and shake the branches so that the olives fall down into the sheets. After being picked, the olives are sorted.

Those which are large and sound are kept for pickling, while the bruised ones are crushed and pressed to squeeze out the oil which we use on our tables for salads.

Olive trees are planted in orchards, in rocky and sandy places. The trees are first sprouted from cuttings in hot-houses, then transplanted, and in seven or eight years they begin to bear fruit. At ten years a good tree should produce five gallons of olives a year; and when fully grown it sometimes produces ten times as much.



Olive-Oil Works.

Have you ever tasted fresh figs? As they hang upon the trees they are twice as large as when dried and pressed into boxes. They are as sweet as honey, and very delicious when eaten with cream. Fig trees grow in many parts of California, and we are shown single trees which have yielded a thousand pounds a year.

English walnuts are planted in orchards. The trees begin to bear at the end of six years, and some trees yield from eight to ten dollars' worth of nuts every year. When the nuts are ripe, they are shaken or knocked from the tree, and packed for shipping.

The first men who came to California were miners; but after a time it was found that the land would grow wheat and other grains, and that it would produce more and better fruits of some kinds than any other part of our country. It was found that the driest of the lands would raise good crops if they could only have water. So large irrigation works were established, and by them California has been turned into one of the most wonderful grain farms and fruit gardens in the world. There are thousands of small farms, of ten acres or less, upon which people make a living. The land produces so much that twenty acres is

A Vineyard in California.

quite enough for one man, and a person who has an orange grove of forty acres is well to do.

You must not think, however, that all the farms of California are small. There are some in the state which are very large. The Vina Ranch, which was given by Senator Leland Stanford to the Leland Stanford Junior University, contains fifty-nine thousand acres. It is bigger than five hundred of the ordinary eastern farms of one hundred acres each; and you will get an idea of its extent when I tell you that its irrigating canals are one hundred miles longer than the distance between New York and Washington.

This farm is north of San Francisco. When I visited it, there were thirty thousand sheep nibbling upon it, and about them were playing seven thousand little lambs which had been born that year. In another place I saw a drove of thousands of hogs, and there were many hundreds of valuable horses. It takes a large number of people to manage a farm of this kind. There were fifteen hundred men working upon it, and I rode from camp to camp, in different parts of the farm, to see how they lived. They slept in sheds, or barracks, many men in one large room. The men of each camp ate together. Their meals were cooked by Chinese cooks; and after the day's work was over they played baseball and other games, and amused themselves by dancing with one another.

Such a farm is managed like a large business establishment. An account of everything is kept, every man knows just what he has to do, and the work is divided up into departments.

An interesting part of this farm is the vineyard, which, I was told, is the largest in the world. It produces enough grapes each year to give a half-pound to every man,

Gathering Grapes.

woman, and child in the United States. If you could imagine a whole county covered with grapevines, you might get some idea of it.

The vineyard is divided up into blocks, just like a city, being cut up by streets and cross streets. The grapes are ripe about the 1st of August, when it requires one thousand men and boys to pick them. Two pickers work together, each carrying a box, and sorting the grapes as they go from vine to vine, putting the poor grapes into one box and the good ones into another.

Is not this a wonderful state? Almost anything will grow better in California than in the eastern part of our

country. Beets are raised, in some parts of the state, which will weigh as much as a good-sized boy; and pumpkins have been grown which have weighed two hundred and seventy-five pounds, or as much as a full-grown pig. There are elderberry bushes in the southern part of California which have trunks from one to two feet in thickness; and there is one rose bush at Pasadena which is said to have one hundred thousand blossoms at one time.

The biggest trees in the world are to be found on the western slopes of the Sierra Nevada. Within a hundred and thirty miles of San Francisco, in Calaveras county, California, there are groves of trees some of which are so big that you could build a very large schoolroom inside of them. Some of these trees are two thirds as high as the Washington Monument, and the top of one of them seems almost to pierce the clouds, for it is between three and four hundred feet above the ground.

A Big Tree.

Many of our houses are not more than thirty feet in width. There is one of these trees which is forty-one feet in thickness, and if it could be hollowed out, you could make a large house inside its bark. Through the trunk of another tree a hole has been cut. This hole is so wide that we can easily drive through it in a carriage, and as we look at the bark, we see that it is almost a yard thick.

The big trees are evergreens, related to the cedars. They have foliage much like that of the cedars found in other parts of the country, and the cones which grow upon them are usually not much larger than a good sized hen's egg. They do not usually grow by themselves, but among other trees, and they tower like giants over the smaller pines below. They seem to increase in size as we come nearer, and at last, when we stand under them and look upward, their tops seem almost to touch the sky. It is hard to realize that they were once only little sprouts pushing their way up through the ground.

Yosemite Valley.

That must have been a long time ago, must it not? Yes, indeed. Some of them are said to be as much as twelve hundred years old. They were eight hundred

years old when Columbus discovered America; and they were quite big trees many, many years before that time.

These trees are very valuable for their lumber. The wood is light, soft, and coarse-grained; but it takes a high polish, and there is so much lumber in a single tree that some have sold for thousands of dollars. Congress has, however, now taken some of the groves into one of the government reservations, and has decided that they shall be kept for all time as one of the wonders of our country.

Another great wonder of California is the Yosemite National Park, which lies in almost the center of the state. This park contains the Yosemite Valley, which is an irregular trough sunken almost a mile below the region about it. The scenery of the valley is grand, and among its most marvelous features are the Yosemite Falls.

Mirror Lake, Yosemite Valley.

At Niagara Falls we saw how the Niagara River made its immense drop of one hundred and sixty feet. In the falls of the Yosemite a branch of the Merced River leaps over the rocks down into the valley. It first takes a jump of more than a quarter of a mile straight down from the top of a cliff, then falls a distance of six hundred feet in a succession of beautiful cascades, and then drops to the bottom of the valley.

One of the falls of the Yosemite is known as the Bridal Veil. The water in this drops down a distance almost one hundred feet greater than the height of the Washington Monument. As it falls it is swayed by the wind and turned to a spray, making it look like a fleecy white veil, which, when the sun strikes it, becomes a sheet of rainbows.

XXXVI. SAN FRANCISCO AND THE CHINESE.

THE large cities of the Pacific slope are to be found at the western ends of the railroads crossing the continent. Most of them have harbors on the coast, so that goods can be easily shipped to and from them by sea as well as by land.

At the south is Los Angeles, at the end of the Southern Pacific Railroad, which starts at New Orleans, and passes through Louisiana, Texas, New Mexico, and Arizona, on its way to California. Los Angeles is so beautiful, and is surrounded by such a beautiful country, that it is well named the "City of the Angels." It is a thriving place, with wide streets lined with shade trees, and many gardens filled with beautiful flowers. Under the city large deposits of petroleum have been discovered, and there are so many derricks that we think of the cities of the Pennsylvania oil regions until we look at the orange trees, the hedges of calla lilies, and the geranium bushes, which here sometimes grow to a height of ten feet. There are banana and lemon trees about Los Angeles, and all kinds of tropical fruits are sold in its markets.

A day's ride by train farther north is San Francisco, at the end of the Central Pacific Railroad, by which we

crossed Colorado, Utah, and Nevada, on our way to California. San Francisco has been called the "Child of the

San Francisco.

Mines." When gold was discovered, it consisted of a few shanties built upon sand hills near the shores of the beautiful San Francisco Bay. Now it has about one third of a million people. It does a vast deal of manufacturing for the Pacific coast. It is one of the great shipping ports of the world, and we see at its docks vessels from Asia, Europe, and Australia. There are ships here which have come ten thousand miles round Cape Horn from New York, and there are whaling ships ready to start out on their cruises to the Arctic Ocean.

We find San Francisco anything but a town of shanties to-day. The sand hills have been cut down, and fine

buildings have taken their places. The residence parts of the city are magnificent. Some of the richest people of the United States live here, and we ride on cable cars up Nob Hill, past the houses of millionaires who have made their fortunes out of gold mines, the vast wheatfields, and the fruit and other industries of the Pacific slope.

Some of the poorer people of San Francisco interest us even more than the rich. These are the Chinese. There are more of them in San Francisco than in any other part of the United States. We see them everywhere on the streets. What queer-looking people they are, and how curiously they dress! They have yellow complexions, and their little black eyes look out of what seem slanting slits in their faces. They are dressed in long gowns of bright cotton or silk, and some of them wear little round skull-caps with a bright button on the crown.

There is a Chinaman who has his hat off! See! his head is shaved up to the crown, leaving a place for the hair to grow that is not bigger than the bottom of a tea-cup. His hair is nicely braided, and his braid, or cue, is so long that it reaches almost to the ground.

There is a Chinese woman. Her eyes are just like those of the men, but her yellow face is painted and powdered. Her head is bare, for Chinese women do not wear bonnets and hats as our women do. They do not cut off their hair like the Chinese men, but comb it in rolls and braids, putting it up in ways which seem very strange.

Notice how that woman walks. She is hardly able to totter along. That is because of her small feet, which are covered by her little red satin shoes. When she was a little girl her feet were so bound up that they could not grow, and the shoes she wears would be tight on the feet of an American four-year-old girl.

We see more men, however, than women. Most of the Chinese who come to America leave their wives and daughters at home. There are quarters of the city in which thousands of Chinese men live. They are packed

Chinese Restaurant — San Francisco.

away at night in large buildings, scores of them often sleeping in the same room. We see them on the streets doing different kinds of work; and did we go into the kitchens of our hotel, we should find that most of the servants are men of this yellow race. Many of the Chinamen act as cooks; many are employed on the fruit farms and vineyards; others have laundries, and a number have Chinese stores in that part of San Francisco where the most of the Chinese live. Not all are poor. They are a very thrifty people, and some of the storekeepers are quite

wealthy. Even the common workmen save their money. They work for low wages, and can live on a few cents a day. When they have saved a certain sum of money they go back to China to live, taking their money with them.

For a time the United States allowed the Chinese to come here; but so many of them were brought across the Pacific that our people became afraid that they would do all the work. It cost them so little to live that they could work much more cheaply than white men, and China has so many people that millions might come away and not be missed. And then, the Chinese who came did not seem to adopt our ways; and hence the government has concluded that, since they are not likely to make desirable citizens, no more Chinese can come into the country. Those who were already here at the time this conclusion was reached are allowed to stay; but all ships coming from Asia are now carefully watched, and the Chinese upon them are not permitted to land.

XXXVII. THE PACIFIC NORTHWEST.

WE will now go by rail from San Francisco to Portland, at one of the western ends of the Northern Pacific Railroad, which crosses the United States from St. Paul. Leaving San Francisco, we are soon passing through the San Joaquin Valley, so noted for its wheat crops that it is called the granary of the state. We spend a day in riding about the slope of Mount Shasta, a wonderful snow-capped, extinct volcano, and then go northward into Oregon.

We are now in an entirely new section of the United

Lumbering in Oregon.

States. We are in what is known as the Pacific Northwest, which is composed of the rich states of Oregon and Washington. These states are much warmer than those in the same latitude upon the Atlantic coast. Oregon is far warmer than Massachusetts. It seldom snows in Washington west of the Cascade Ranges, and its people have called it the "Evergreen State."

How can this be, and the states be so far north?

It is because of the Japanese Current. You have heard of the warm ocean current, known as the Gulf Stream, which flows up from the Gulf of Mexico through the Atlantic Ocean. The Japanese Current is a stream of the same kind in the Pacific Ocean. It begins near the coast of China, flows north about Japan, then crosses to the lower part of

Alaska, and flows down by Puget Sound. Its waters act like a hot-water furnace. They warm the air above them, which blows on the west coasts of America and keeps warm the states of Washington and Oregon. For this reason there is but little snow in these states. Most of the rains which fall are warm, and the moist climate covers the earth with a luxuriant vegetation.

Some of the largest trees in our country are to be found in the Pacific Northwest. In Washington there are miles of forests of trees, which shoot up as high as a very tall church steeple before they put out a branch, and then go upward with branches perhaps a hundred feet higher. Many of these big trees are hollow, and a story is told of a Washington farmer who used one of them as a house while clearing his farm. The hole in the tree was twenty-two feet in diameter; it was forty feet high, and a knot hole near the top formed his chimney. He put a floor inside the tree eight feet above the earth, and upon this, the second story, lived with his family, while he used the space beneath, or the ground floor, as a stable for his horse and cow.

Some of the best timber in the world comes from this region. Shingles are made by the millions, and shipped to the East. The long trees are cut into logs and exported to other countries, many of them being used as masts and spars for vessels.

Both Washington and Oregon are rich farming and stock-raising states. They produce great quantities of fine wheat. Large crops of barley, flax, and hops, and all the vegetables and fruits of the temperate zone are grown. The states are rich in coal and iron, and they have also large deposits of gold and silver. We see that the people are everywhere prosperous. Many of the farmers have

large droves of sheep. New lands are being brought into cultivation, and the country is being rapidly settled. There are numerous villages, and we can visit many large towns.

We spend a few days in Portland. It is situated on the Willamette River, twelve miles above the Columbia River, and is a great lumber, commercial, and manufacturing center. Its business buildings will compare favorably with those of any of our eastern cities, and it steadily grows in size and wealth.

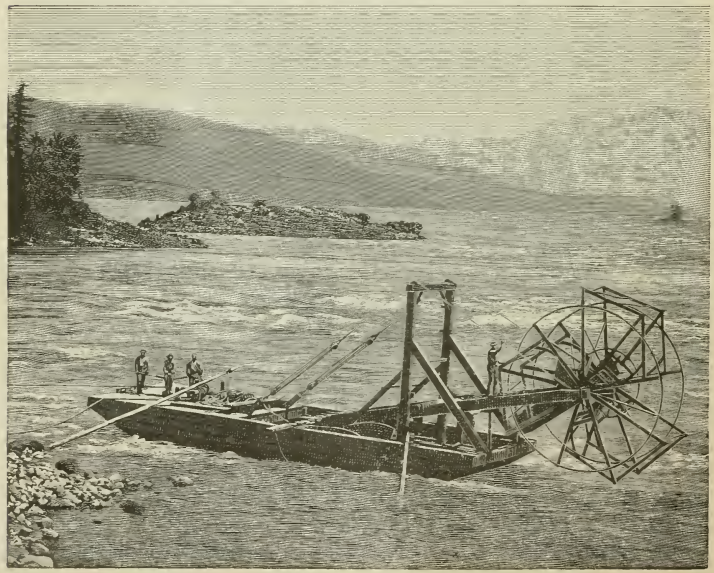
From Portland we take a sail up the Columbia River to see something of some of our best fishing grounds. Have you ever eaten Columbia salmon? It is sold in cans in almost every grocery store. It is delicious when eaten

Fishing for Salmon.

with a little lemon juice, or made into a salad. Fresh salmon is far better, and at our breakfast on the boat we order salmon steaks. The fish are so large that they are sometimes served in this form, and we eat great slices of

the yellowish-red fish which is brought smoking hot to the table.

The salmon spend the most of the year in the salt waters of the ocean. In the summer they come into the rivers to lay their eggs, and at certain times the Columbia is almost filled with them. They move in droves up the river, and are caught by nets and traps in great numbers. In a single year several millions of pounds of these fish are caught. Within the past thirty years it is said that salmon to the value of seventy million dollars have been taken out of the Columbia River. They are cooked and canned and sent to all parts of the world. It takes only three ordinary salmon to fill four dozen one-pound cans.



Fish Wheel.

The fishermen are for the most part white men, though a few are Indians. In some parts of the river, where the currents are swift, fish wheels are used. Sometimes such wheels are fastened to the end of a boat which is anchored at the right spot. The wheel is much like a mill wheel, save that wire nets are fastened to its rim, and, as the wheel turns and the nets strike the water, the fish are caught by them. The wheel, going on, lifts the fish up and slides them down into a trough, through which they fall into the boat. One night, not long ago, one wheel of this kind, fastened to a vessel, caught enough fish to sink the vessel, or fifteen tons of fish, in twelve hours. This, Oregon people say, is a true fish story.

Coming back to Portland, we again take the cars, and a day's ride to the north brings us to Puget Sound. Here we visit the cities of Tacoma and Seattle, on the eastern shore of Puget Sound, sometimes called the "Mediterranean of the Pacific." Within plain view of both is Mount Rainier, or Tacoma, one of the highest peaks of the West.

The summer of these cities is about as cool as that of St. Paul, and the winters are as warm as those of Tennessee. Such snow as falls is almost immediately melted by the warm winds from the ocean. The summer days are clear and bright, and the location of the cities so far north gives them a long twilight during a part of the year.

Both Seattle and Tacoma have all the improvements of our best eastern towns. They have fine libraries and schools. They have good stores, and do a large commercial and manufacturing business. They are located on excellent harbors, and we can find ships at their wharves which will take us to almost any part of the world.

From these ports steamers sail regularly for Alaska; and, a little later on, we shall take a trip northward to learn

something of that curious land, the last of our territories. But before taking ship, there is still another very interesting and wonderful region in this western part of our country which we must visit. Let us take a side trip five hundred miles southeastward, and see some of the wonders of the Yellowstone National Park, in the heart of the Rocky Mountain highland.

XXXVIII. THE YELLOWSTONE NATIONAL PARK.

THE Yellowstone Park is in the northwest corner of the state of Wyoming, just about midway between St. Paul and Portland, Oregon. You must not think it is little because it is called a park. The Yellowstone Park is almost as big as the state of Connecticut. It is owned

View in Yellowstone Park.

by the government, and Congress has decided that men must never use any of it for farming, but that it must always be kept as a great park, belonging to you and me and to the other people of the United States in common. This is because it is so full of natural wonders.

The Yellowstone Park, at its lowest point, is more than a mile above the sea; and there are mountains about it which are more than two miles in height. The surface of the park is a rolling plateau, parts of which are covered with woods, while in other parts are wonderful cliffs and deep, yawning canyons.

The most curious features of this region are its geysers and hot springs. There are more than a thousand such in the park. There are five hundred hot springs which are always boiling up water and mud. The water and mud contain different kinds of minerals, and as they fall back they leave a sediment, which in time builds up wonderful structures of all the colors of the rainbow.

There is one hot spring which has formed a white hill about it more than two hundred feet high. As the water flows over the top of the hill, it falls into one semicircular basin after another built up by the sediment. Some of these basins are only a few inches deep, and others have a depth of six or eight feet. The mineral matter crystallizing from the water which flows over the sides of these basins has painted upon them all shades of blue, scarlet, green, and yellow. It has frescoed some with lacework, and given other portions the appearance of having been embroidered with beads. The water at the top is boiling hot. It grows cooler as it falls from basin to basin, so that, starting at the bottom, we could have a bath at any temperature by merely walking up to the top.

What would you think of a spring which always flowed

Hot Springs.

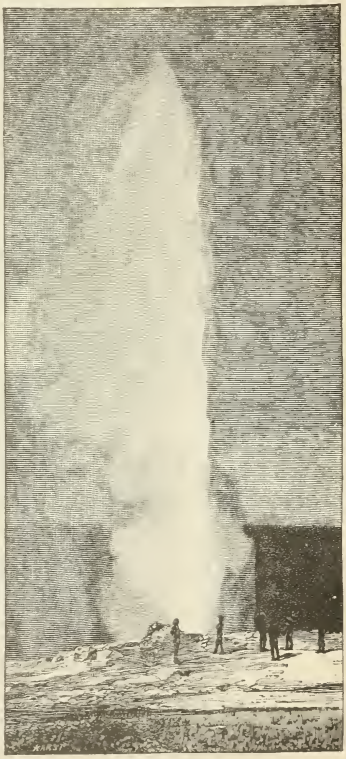
mineral paint? There is such a spring in the Yellowstone Park, which boils and boils until it has made a great paint pot covering more than an acre. The paint is of all colors, and it bubbles up like a pot of hot mush.

Another fountain is always vomiting forth masses of green, slimy mud mixed with sulphur. The smell of this spring is so sickening that you must put your handkerchief to your nose as soon as you come near it.

The geysers are hot springs which from time to time throw enormous bodies of boiling water and steam into the air. Some of them spout every year or so, and some every few minutes. The Grand Geyser, the greatest in the world, throws a volume of steam and boiling water three hundred feet into the air; and another, called Old Faithful, sends up an immense volume of steam and boiling water as high as a very high church steeple every hour. Old Faithful keeps spouting for several minutes, and the water falls back in clouds of steam and spray. There

are other geysers which throw up quantities of mud, and the most of the geysers build up stony foundations about them, formed of the minerals which are in their water.

Another wonder of the Yellowstone Park is the Yellowstone River and its canyons. At one place the waters of this river have a fall of three hundred feet, or almost twice that of the American Falls at Niagara. They go through a gorge, or canyon, far more wonderful than that of the Niagara River. The walls of the canyon are a third of a mile high, and the rocks which compose them are of such colors that the river seems to flow between walls of precious stones. There are tons of rock as white as crystal, great pieces of stone which shine like amethyst, and here and there rocks which glitter like diamonds in the sun. Halfway down the walls of the canyon there are ledges upon which the eagles have built their nests; and if we look carefully we may perhaps see the young eagles in them.



Old Faithful.

These are only a few wonders of the Yellowstone Park. We hardly dare describe this curious region, for fear peo-

ple may think of us as they did of a preacher who once visited the Park, and, upon going home, gave a lecture upon it to his congregation. The people listened quietly until he said that he stood upon a rock by the beautiful Yellowstone Lake, and caught a fish, and then, without moving his position, gave his fishing rod a twist and threw the fish, still hanging to the hook, into a boiling spring behind him and cooked it. As he said this, one of the deacons arose, and asked the pastor to stop right there,

The Fish Pot.

saying: "We have listened to-night to bigger stories than we have ever heard in our lives before; but that last one is too much — too much!"

The story, however, might easily have been true. Yellowstone Lake is as clear as crystal. Its waters are cold, and they are filled with fine fish. Upon its eastern shore, only a few feet away from the edge of the water, there is

a deep boiling spring called the Fish Pot, and you really could catch a fish and thus cook it without changing your position.

But it is time now to return to the Pacific coast. We can go on the Northern Pacific or the Great Northern railroad back to Tacoma through a succession of interesting scenes. We pass through the mining regions of Montana, where many millions of dollars of silver and gold are obtained every year. Near Butte is the famous Anaconda Mine, from which four thousand tons of copper ore are shipped daily—the largest output of copper in the world. We cross the state of Idaho in its narrow part, following for twenty-five miles the north shore of Lake Pend Oreille, one of the most beautiful sheets of water in the world. Travelers say that its scenery very much resembles that of the famous Königs-See in Bavaria.

Falls of the Yellowstone.

Before reaching Puget Sound, we pass through Puyallup Valley, celebrated for its hop fields. The cultivation of hops is now one of the great industries of the state of Washington. During the hop harvest as many as five thousand Indians come on ponies from beyond the mountains, or in canoes up Puget Sound, to find employment in the fields. The picking of the hops is done by the Indian

A Hop Field.

women and children, while the braves look on, and smoke, and trade horses. The average yearly crop of hops in Washington is valued at about two million dollars.

XXXIX. AMONG THE INDIANS.

WE find Indians not only in the hop fields of Washington, but at the railroad stations in the West, where they have come to sell deer and buffalo horns, and moccasins made of skins and embroidered with beads. What queer people they are, and how sober they look as they squat or stand about the depots, with their merchandise in their hands! Their faces are of a reddish or copper color. This is why they are called the red race. They have

long, coarse black hair, straight noses, high cheek bones, and black eyes. Both men and women part their hair in the middle and wear it long.

But where are the feathers which we usually see on the Indian's head in the pictures? Very few Indians wear feathers in their hair in times of peace. Indians now dress much like white people, except that they have gaily colored blankets over their shoulders. Some of the men wear soft hats, and nearly all of them have on pantaloons. The women, or squaws, wear dresses, but their heads are bare.

A Papoose.

Some of the women have curious bundles on their backs. The bundles look like bags, or boxes made in the shape of a little coffin. There is a squaw who has turned about, and we can see her bundle more plainly. Notice that hole in its top and the odd little brown head peeping out of it. That is an Indian baby, or papoose. See how sober it is. It turns its head about, but it does not cry. Indian babies seldom cry, though you would think that being squeezed up in that cramped position would make them do so. When the mother goes home she takes the baby off her back, and stands its curious cradle up against

a log or the side of the house until she is ready to take it again.

But where do the Indians come from? When Columbus discovered America there were Indians all over this continent. They were the only people on this side of the world. There were not very many of them, however, and it is said that there were not half as many Indians in our entire country as there are now people in Chicago.

Indian Chief — Black Bear.

When our forefathers landed on the Atlantic coast, they made treaties with the Indians by which they got some land. Then there were Indian wars, and, step by step, the white people crowded the Indians westward. They made other treaties by which they paid the Indians for more and more of their lands, until now all of the country which the Indians have left is not much more than half as large as the state of Texas. This land is chiefly in the West, and a large part of it is among the Rocky Mountains. It is divided up into many tracts, called reservations, each reservation belonging to one tribe, or nation, of Indians. There are many such reservations in different parts of our country, the largest of all being in the Indian Territory.

And are there many different kinds of Indians?

Yes, indeed; all Indians are by no means alike. If the boys of the different Indian tribes were to come together, they could no more understand one another than American boys could understand the language of German, French, or Italian children. There are more than sixty different Indian languages spoken in the United States, and the only way some tribes have of communicating with other tribes is by signs.

There is also a great difference in the customs of the different Indian tribes. Some are civilized, and a few are still savage. The savage Indians who once lived east of the Mississippi are now confined to some of the Western reservations, and are chiefly hunters and fishermen. They farm but little, and they still live in wigwams, or tents made of bark or skins. They move their camps from place to place, and their chief wealth is in their cattle and horses.

Indian Chief.

The savage Indians were in former times dangerous and cruel foes. They took delight in killing women and children. They hid behind rocks and bushes to fight. Still, when they were cornered they would fight to the death. They used tomahawks to brain their victims, and delighted in torturing their captives and in

burning them at the stake. They scalped the men they killed in battle; that is, they cut a little piece of skin, about as big as a dollar, out of the crown of the head of each man, leaving the hair on so that they could tie it to their belts. It was a great honor to a warrior to have taken many scalps.

All the Indians are fond of children. Among the Chippewas, who live in Minnesota, the mother has the entire control of the children until they are almost grown. The mother teaches the boys and girls to hunt and fish. They are taught to paddle canoes, and Chippewa boys and girls are always at their ease on the water.

The children of this tribe choose their own names. When the child arrives at the age of twelve or thirteen he finds, some morning, a bowl of charcoal placed before him instead of his regular food. The child knows at once what this means. It means that he must go off into the woods and fast. He remains in the woods until he falls asleep, and if during his sleep he dreams of some animal, he chooses the name of that animal for his own name, and that animal is considered his best spirit. Girls and boys of this tribe are often married before they are fourteen, and an Indian usually chooses a good, strong girl for his wife; for the squaw does most of the work, and a sickly girl is looked upon as being of little account.

Among most of the Indian tribes, a brave has to pay a certain number of ponies for his wife; but the girls have usually the right to choose whether they will be married or not. Among the Osages, who live in the Indian Territory, when a man wants to marry he puts on his best clothes, mounts his finest horse, and rides about the girl's tent, watching her day after day, until she finally goes out and speaks to him. If she does this, he knows that she

will accept him if he can pay the price to her father. Sometimes a man can get a good wife for two horses and a dozen skins; but Indian belles have been known to bring as much as two rifles, thirteen horses, and a gallon of whisky.

In some parts of the Southwest we shall find Indians who have always lived in towns, and whose forefathers were farmers long before Columbus discovered America. There are no queerer towns in the world than the pueblos or towns of the Moqui Indians in New Mexico and Arizona. Often you will see a little flat-topped hill rising seven or eight hundred feet above the rest of the country. Upon these the Indians build their houses, because there they are safe from wild animals and from their enemies.

A Pueblo.

They make the houses of stone or sun-dried bricks, and they build one on top of the other, in great terraces or steps, so that you can climb from house to house on ladders. In some of the pueblos there are no doors to the first house, and you have to go up a ladder and get on the roof before you can come to the ground floor. To get to the second house, you must enter from the roof of the first, and so on.

The roofs of the lower houses form the playgrounds of the children above. Many of the pueblos have dogs and cats; and these animals, as well as the children, climb up and down ladders and steep stone steps, going with the greatest ease from roof to roof.

Many of the Pueblo Indians are farmers. Some of them have large peach orchards, surrounded by stone walls to keep out the sheep and goats. They raise apricots, watermelons, and also corn, beans, and pumpkins. They make blankets, baskets, and pottery; and they are in many ways quite civilized.

The Navajo Indians have thousands of horses, and hundreds of thousands of sheep. They are rich Indians, and are industrious. They live in little round huts made of poles covered with earth, which have holes in the top for chimneys. Some most beautiful blankets are made by Navajo squaws. The blankets are woven by hand, and often sell for as much as one hundred dollars apiece.

A large number of Indians live in the Indian Territory. This territory is one of the richest parts of the United States. It was set aside for the Indians more than fifty years ago, and Congress for a time hoped to make it the home of all the Indians. As it is now, the best part of it is owned by the five civilized tribes. These are the Cherokees, the Chickasaws, the Choctaws, the Creeks, and

arms of the ocean run into the country for many miles; and it has one river, the Yukon, which is navigable for small steamers for a greater distance than the length of the Mississippi River between New Orleans and St. Paul.

The glaciers of Alaska are among the largest in the world. Upon the western slope of Mount St. Elias there are eleven enormous blocks of ice moving down toward the water. One of these ice blocks is fifty miles long and twenty miles wide, and another, as we see it from our steamer, is a wall of ice two hundred feet high and five miles wide, and it stretches back as far as our eyes can reach.

The Alaskan glaciers are wonderfully beautiful. The ice is of the clearest blue, and the glaciers look like huge blocks or walls of sapphire. They look as though they were great torrents of water which had been frozen as they were about to plunge into the sea.

Take the Muir Glacier, for instance, which faces the sea on Glacier Bay. If you could double the height of Niagara Falls, and make it twice as wide, and then freeze the whole mass of sparkling water as it falls, you might have some idea of this wonderful glacier. You must, however, imagine a background of great mountains covered with snow, and a bright sun which lights up the icicles so that they shine with all the hues of the rainbow.

Such glaciers are always moving downward, and parts of them every now and then break off and tumble into the sea. As they break, there is a noise like thunder. The piece falls down, down, down, under the water. The water boils, the waves roll, and a moment later a great iceberg rises to the surface.

In traveling through these seas, we are seldom out of sight of icebergs, and we must be very careful to have our

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Many of the Pueblo Indians are farmers. Some of them have large peach orchards, surrounded by stone walls to keep out the sheep and goats. They raise apricots, watermelons, and also corn, beans, and pumpkins. They make blankets, baskets, and pottery; and they are in many ways quite civilized.

The Navajo Indians have thousands of horses, and hundreds of thousands of sheep. They are rich Indians, and are industrious. They live in little round huts made of poles covered with earth, which have holes in the top for chimneys. Some most beautiful blankets are made by Navajo squaws. The blankets are woven by hand, and often sell for as much as one hundred dollars apiece.

A large number of Indians live in the Indian Territory. This territory is one of the richest parts of the United States. It was set aside for the Indians more than fifty years ago, and Congress for a time hoped to make it the home of all the Indians. As it is now, the best part of it is owned by the five civilized tribes. These are the Cherokees, the Chickasaws, the Choctaws, the Creeks, and

arms of the ocean run into the country for many miles; and it has one river, the Yukon, which is navigable for small steamers for a greater distance than the length of the Mississippi River between New Orleans and St. Paul.

The glaciers of Alaska are among the largest in the world. Upon the western slope of Mount St. Elias there are eleven enormous blocks of ice moving down toward the water. One of these ice blocks is fifty miles long and twenty miles wide, and another, as we see it from our steamer, is a wall of ice two hundred feet high and five miles wide, and it stretches back as far as our eyes can reach.

The Alaskan glaciers are wonderfully beautiful. The ice is of the clearest blue, and the glaciers look like huge blocks or walls of sapphire. They look as though they were great torrents of water which had been frozen as they were about to plunge into the sea.

Take the Muir Glacier, for instance, which faces the sea on Glacier Bay. If you could double the height of Niagara Falls, and make it twice as wide, and then freeze the whole mass of sparkling water as it falls, you might have some idea of this wonderful glacier. You must, however, imagine a background of great mountains covered with snow, and a bright sun which lights up the icicles so that they shine with all the hues of the rainbow.

Such glaciers are always moving downward, and parts of them every now and then break off and tumble into the sea. As they break, there is a noise like thunder. The piece falls down, down, down, under the water. The water boils, the waves roll, and a moment later a great iceberg rises to the surface.

In traveling through these seas, we are seldom out of sight of icebergs, and we must be very careful to have our

ship out of the way when a glacier breaks and an iceberg is formed.

But it must be very cold where there is so much snow and ice, must it not?

Yes; the most of Alaska is covered with snow the greater part of the year. The winters are very long and cold, and the summers short. Much of western Alaska, however, is so affected by winds from the warm Japanese Current that some parts of it, especially those near the coast, are quite habitable for civilized man.

We find the climate of Sitka, for instance, mild. The

A Glacier — Alaska.

thermometer there seldom gets below zero in the winter, nor does it rise much above eighty in the summer, although it rains or snows during the greater part of the year.

As we sail along the coast of this part of the territory, we pass forests almost as dense as those of Louisiana or Florida. There are wild hops, wild onions, and wild berries of many kinds. The raspberries are delicious, and at the entrance to Glacier Bay there is a place known as Strawberry Point, where there are so many wild strawberries that when they blossom the land looks like a field of daisies, and when they ripen the berries fairly make the ground red. There is much grass on the islands of western Alaska; and even upon the coast of northern Alaska, along the Arctic Ocean, dandelions and buttercups blossom in July and August, although they have only a few days to live.

The people who inhabit Alaska are mostly Eskimos and Indians. The Eskimos are found not only here, but in many of the very cold parts of North America. They are shorter than our Indians. They have coarse black hair, black eyes, high cheek bones, and broad, flat noses. They dress in furs, both men and women being clad in fur from head to foot, and having fur hoods which they draw up over their heads. In the colder parts of Alaska many have a second garment of fishskin, which they wear over the furs. The fishskin garment is considered a very desirable one, for, in case of necessity, its owner can eat it. Both men and women often wear pièces of bone and ivory in their lower lips and noses as ornaments, and many tattoo their faces.

The Eskimos live, for the most part, on fish and seals. They are fond of all kinds of fats, and it is said that they will eat tallow candles if they have but little food. One missionary who traveled through Alaska says that he had great trouble keeping his castor oil, for the natives looked upon it as a delicious foreign drink. He had to limit his

prescriptions to one dose at a sickness, and would never allow a patient to have more than four tablespoonfuls at one time.

We see many Indian villages as we sail along the coast. The most of the Indians of southern Alaska have their towns upon the beach: first, because they get their living from the sea by fishing; and, second, because the forests, except along the beaches, come close to the water's edge. Many of the towns consist of but one row of wooden huts, in front of each of which stands a great carved pole or post called a totem. The totems are from thirty to fifty feet high, and in the distance they make you think of a forest of dead trees until you come closer and see the houses below them. These totems are covered with carvings of different animals and birds. Upon some of them are bears, whales, eagles, or ravens. Others have grotesque figures of men. They might be called the coats of arms or memorial posts of the natives, and are not idols, as has been sometimes supposed.

Totem Poles.

As we sail farther north we still find that most of the villages are near the coast. Many of the houses are underground, being made so for greater warmth.

In the summer many of the Eskimos live in skin tents, and in winter they often make a tent of pure ice, stretching their summer tent of skin over the top as a roof. They keep their houses a little warm with stove lamps, but as a rule they rely chiefly upon their clothing for heat. They travel from place to place upon snowshoes, carrying their household goods on sledges drawn by dogs or reindeer.

The chief things for which Alaska is valuable to us are its fish, furs, and minerals. The fish of Alaska are caught by the millions every year, and are shipped to the markets of our country and Europe. During certain seasons the salmon come into the rivers in such droves that they almost fill them, and there are immense factories in which they are cured and canned. Great quantities of codfish and herring are caught, and the whaling industry also is quite valuable.

The furs of Alaska have, however, been worth much more to us than the fish. On some of the Alaskan islands are the great seal-catching grounds of the world. The skin of the fur seal is used to make sealskin coats and jackets. The seals are among the queerest of animals. They are quite large, the males often weighing five hundred pounds, and the females about one fifth as much.

The seal has beautiful eyes of a bluish hazel or black, which change in expression when he is angry or good-humored. His mouth and jaws are not unlike those of a Newfoundland dog, save that the lips are more firmly pressed together. He has flippers under his body. Those at the shoulders look like a pair of black hands, the arms being concealed under the skin, and the hind flippers take the place of legs and feet. Each seal has two coats of fur. One is a short, crisp, bristly one of hair, and under this there is a soft, close one of a downlike fur.

Seals.

One of the queerest things about the seals is the summer trip which they all make to Alaska. Is it not strange to think of an animal having a summer home? This is the case with the seals. During the winter they live in the warm waters of the Pacific Ocean, far south of Bering Sea. Every spring they come northward by the tens of thousands. They swim on and on until they reach four little islands, known as the Pribilof Islands, in the heart of Bering Sea. Here they climb up on the rocks, and stay until cold weather comes, when they again swim south to spend the winter. It is upon these islands that all the young seals are born. The male seals come first, and pick out the spots where they are to live with their families; then, a few weeks later, the females are seen swimming in; and soon the island is covered with little colonies of seals, each of which keeps, to a certain extent, to itself.

The baby seals make us think of young dogs, and their cry is like the bleating of a lamb. The mother calls her little ones to her with a noise like that of a sheep, and the little seals play about together much like little puppies. When they are about six weeks old, they go into shallow pools and learn to swim; and as they get stronger, they

Sitka, the Capital of Alaska.

roll down into the sea and take excursions of miles. The seals are so valuable that men are allowed to kill only a few of them each year. The ones chosen are males from three to four years old. They are not at all hard to catch, for they are not much afraid, and they can easily be driven off in herds or droves, apart from the others. The seal hunters carry clubs about seven feet long and as thick as baseball bats. They stun the animals by striking them on the skull, and then other men come along with sharp knives and kill the poor beasts.

The skins are then taken carefully off, and laid in large piles, with layers of salt between them. After being thoroughly salted, they are done up in square bundles,

and shipped to London, where all the fur sealskins are dressed. This is done by shaving the skin very thin. This cuts off the roots of the stiff hairs which form the outer coat, but does not touch the roots of the downy fur below. The long hairs are now brushed off, and the downy fur is dyed black or a rich brown, just as you see it on sealskin coats.

The minerals of Alaska are very valuable. Vast quantities of gold have been discovered in different parts of the territory. As we sail from Puget Sound to Sitka, we go by Douglas Island, on which is the famous Treadwell Mine, out of which vast quantities of gold have been taken. The sands of some of the islands of Alaska are mixed with gold, and on the island of Kadiak men are to be seen who are washing the sand to get out the gold.

XLI. BRITISH AMERICA.

THERE are several ways by which we can go from Alaska into British America. We might sail back to Puget Sound, and thence cross the southern parts of British Columbia and Canada by the Canadian Pacific Railroad; but we prefer to go up the wide Yukon River into the Canadian Dominion. In 1897 rich discoveries of gold were made on the Klondike, a branch of the Yukon. Since then thousands of men have gone there for gold. They have to undergo more hardships than the miners we saw farther south. The summers are very short, and the ground is frozen about two thirds of the year. Most of the gold is washed out of the earth along the streams. During the winter, fires are built on the ground to take

Washing Gold on the Klondike.

out the frost. Then the gold-bearing earth is dug up and carried to the stream, and piled up there to remain until summer melts the ice and gives the miners water with which to wash out the gold.

We travel many days before we reach the gold fields. We go on through the regions of the Klondike to Dawson City, and then prepare for our long trip through one of the wildest parts of North America. We leave the Yukon, and, with sledges and dogs to haul our camping outfit, we make our way over the passes of the Rocky Mountains to the Mackenzie River. We then move back toward the south, and cut our way through the forests to Hudson Bay. Finally, after a long and weary journey, we come down into the more settled parts of Canada.

As we travel through the northern parts of our continent we are amazed at its extent and curious features. There is so much of it that it would take years to explore it.

150
140
130
120 Long. 110 West 100 from
ARCTIC
OCEAN
ALASKA
(To United States)
Yukon
Porcupine R.
Ft. Yukon
Ft. McPherson
Dawson City
Klondike R.
Mt. St. Elias
18,000
Mt. Logan
19,500
YUKON
Lewes R.
Pelly L.
Ft. Norman
Mackenzie R.
C. Bathurst
C. Kellett
BANKS LAND
Melville Sound
Barrow Str.
FRANKLIN
PR. ALBERT LAND
MacClintock Chan.
PR. OF WALES LAND
C. Parry
WOLLASTON LAND
VICTORIA LAND
Dease Str.
Victoria R.
KING WILLIAM I.
BOOTHIA
C. Barrow
Great Bear Lake
ARCTIC
MACKENZIE
Peace or Back R.
Aylmer L.
Artillery L.
Ft. Providence
Doobaunt L.
Baker L.
BARREN LANDS
Great Slave Lake
Ft. Resolution
Fish R.
Island L.
Ft. Liard
Ft. Vermilion
Hay R.
Athabaska L.
Peace R.
ATHABASKA
Wollaston L.
Ft. McMurray
Reindeer L.
Ft. McLeod
Ft. St. John
Athabaska R.
Clearhill R.
Indian L.
Nelson R.
Ft. Assiniboine
Edmonton
Saskatchewan R.
Battleford
Prince Albert
SASKATCHEWAN
Severn L.
Lake
Winnipeg
L. Winnipegosis
Ft. Pelly
ASSINIBOIA
MANITOBA
Medicine Hat
REGINA
Manitoba L.
Brandon
WINNIPEG
Lone L.
Red R.
Missouri R.
Helena
MONTANA
NORTH DAKOTA
Bismarck
MINNESOTA
Yellowstone
SOUTH DAKOTA
St. Paul
Pierre
WYOMING
Cheyenne
NEBRASKA
IOWA
UNITED STATES
IDAHO
OREGON
WASHINGTON
CALIFORNIA
Salem
Olympia
Columbia R.
Juan de Fuca Str.
VICTORIA
Nelson
Kootenay R.
Columbia R.
Mt. Brown
Mt. Hooker
Yellow Head Pass
Yellow Head Range
Gold Range
Cascade Range
Selkirk Range
Rocky Mts.
CALGARY
Ft. McLeod
Ft. Macleod
Blairmore
Crowsnest Pass
Crowsnest Mt.
Kananaskis Pass
Kananaskis R.
Bow R.
Bow Pass
Bow Valley
Bow Lake
Bow Glacier
Mt. Temple
Mt. Hector
Mt. Victoria
Mt. Lefroy
Mt. Goodsir
Mt. Stephen
Mt. Dennis
Mt. Sir Donald
Mt. Macdonald
Mt. Cheops
Mt. Fox
Mt. Sir Sandford
Mt. Bonney
Mt. Lyell
Mt. Forbes
Mt. Brown
Mt. Hooker
Mt. Athabaska
Mt. Wilcox
Mt. Murchison
Mt. Alexandra
Mt. Saskatchewan
Mt. Wilson
Mt. Chephren
Mt. Cephren

BRADLEY & POATES, ENGR'S, N.Y.

Great Britain owns almost as much land in North America as the United States. British America is about forty times as big as Great Britain. It comprises one third of the whole British empire, and almost one fifteenth of all the land on the globe.

We travel for days in the upper part of this vast territory. It is so far north that the trees are stunted by the cold and never grow higher than a two-year-old child; and we can hardly realize that we are in the same country past which we sailed as we left Puget Sound on our way to Alaska. The southwestern part of British Columbia is well wooded. It has fir trees and cedars almost as tall as the tallest church steeple. British America, in fact, contains the greater part of the trees now left in North America. From Hudson Bay to the head of Lake Superior there is an almost unbroken line of forest; and, going some distance north of this, you could travel from the Atlantic to the Rocky Mountains and never get out of the woods.

The most of the country is as wild as it was when Columbus discovered America. We sometimes go for days without seeing a white human being. In the extreme north we meet a few Eskimos in furs, and now and then an Indian from one of the tribes of the North. There are, in all British America, only about one hundred and twenty thousand Indians, scattered over the country in wandering tribes. The white people, including those of the cities, are not more in number than the population of the state of New York, and in the far North we meet no whites at all, except now and then an agent of the Hudson Bay Company.

We often stop with these agents as we go on our way. Each of them has a little store filled with goods for trading with the Indians, and we see these people bring in all

kinds of furs and trade them for powder, glass beads, blankets, and other things. For more than two hundred years the Hudson Bay Company has controlled the fur trade of British America. It has its agents now everywhere in these cold regions, and its members have grown rich by trading with the trappers and Indians.

Trading Post — Hudson Bay Company.

The Hudson Bay Company was organized in 1670. At that time King Charles II. of England gave a party of Englishmen the exclusive right to trade with the Indians in the basin of Hudson Bay. After a time they controlled the whole of the territory between the coast of Labrador and the Rocky Mountains, and had in their employment hundreds of agents and traders, besides many Indians.

But could they find much of value in this wild and desolate region?

Yes, indeed! The Canadian Dominion is one of the great fur lands of the world. In its forests are great numbers of deer, bears, minks, foxes, and wolves. There are also beavers and otters in its rivers and lakes. Millions of skins and furs are yearly bought by the agents of this company, and shipped to London, where they are prepared for the markets of the world.

A Moose.

The Indians do not receive money for the furs and skins which they sell. The trade is carried on by barter, of which the unit of account is the beaver skin. One beaver pelt is worth twenty muskrat skins or two marten skins, and a silver fox is worth five beavers. The Hudson Bay Company send out blankets, beads, knives, and other things to their trading posts, and the Indians know very well just how much they should get for their skins.

The agents of the Hudson Bay Company tell us that they are often a year without seeing a white man. This is especially the case with the agents near the coast of Hudson Bay. These men are visited by ships from Great Britain only once a year. The ships enter the bay about the middle of July, bringing supplies for the agents; they leave it about the middle of September, loaded with skins and furs for London.

We find no lack of either game or fish in our journey. We live in large part on what we shoot on the way. We now and then kill caribou, or small deer, and are very proud when we bring down our first moose.

Moose hunting is by no means child's play. Many of the male deer of this species are eight feet high, and their enormous antlers, or horns, are so large that from tip to tip they sometimes measure six feet.

The best time to hunt moose is in the winter. Our Indian guides go with us, and we soon find a moose yard. This is the name of the spots in the swamps where the moose have regular feeding grounds. We find the yard by the tracks of the moose in the snow, and we prepare for our hunting by putting on snowshoes; for in these we can run rapidly, while the moose, being very heavy, will sink down through the crust, and cannot escape.

Now we are near the yard. We hide behind the trees, with our guns at our shoulders. The Indian guides call the moose by imitating their cry, and soon the great creatures are seen making their way through the snow. They seem suspicious; but the wind is blowing toward us, and they cannot scent our presence. We aim very carefully, and bring down the game at the first shot. Had we not done so, the moose might have turned upon us and crushed us with its horns. The big animal is a fierce fighter when wounded, and for that reason it is a good thing to have a repeating rifle when you are hunting such game.

A Grizzly Bear.

In the western part of British America we find panthers, grizzly bears, and mountain sheep. The grizzlies stay in the gloomiest parts of the Rocky Mountains. They are enormous beasts, and the persons who hunt them take their lives in their hands. The mountain sheep are found high up in the hills, above where the grizzlies live. They are very sure-footed, jumping from rock to rock, and are exceedingly difficult to kill.

There is excellent fishing in all parts of Canada. The lakes and streams are alive with fish, and we catch all sorts of the finny tribe, from the sweet-fleshed brook trout to the great salmon which weighs as much as a good-sized baby.

Had we time to spend a summer in the Arctic Ocean, about the mouth of the Mackenzie, we might even catch whales, for here is one of the best whaling grounds in the world. The steam whale ships, which we saw at the San Francisco docks, go to the mouth of the Mackenzie, and sometimes vessels winter there, being frozen in the ice.

In former times whales were caught chiefly from sailing vessels. The seamen, as soon as they got near enough to a whale, threw a harpoon, with a rope attached, into it. The sharp, arrowlike head of the harpoon stuck into the whale's flesh, and the great creature struggled in the water until it was tired out and could be killed. It was cut up in the water, and the huge pieces of whale blubber were raised to the ship's deck, to be made into oil.

Now much whaling is done by little steamers which carry cannon and shoot the harpoons into the whales. To the harpoons are attached ropes, which are also fastened to the ships, and it is not a hard matter to kill a whale when once the harpoon is in him.

Whales are also caught off the coast of Greenland, and

they are often captured in the waters along the coast of Labrador and in the Gulf of St. Lawrence. They are valuable for their oil as well as for the bones. The whalebone is taken from the mouths of the whales.

The Canadian salt-water fisheries are very extensive. You have heard of the banks of Newfoundland. These are the greatest fishing grounds that have ever been known. Just south of the island of Newfoundland there is a plain under the sea, about two hundred miles long and seventy miles wide, where codfish, herring, and mackerel come by the millions to feed. These fishes are fond of cold water, and the Arctic Current, which washes the coast

Icebergs.

of Labrador, brings down a sort of slime containing sea life, which forms their favorite food. The waters here are covered, the greater part of the time, with fogs. Now and

then huge icebergs float through them, and fishing is exceedingly dangerous.

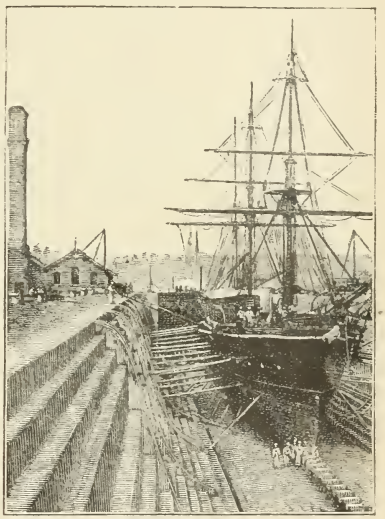
Still, fishing vessels come here from all parts of the world, and more codfish are caught on the Grand Banks of Newfoundland than anywhere else in the world. There are so many cod caught, in fact, that if the dried codfish exported in one year should all be sent to the United States, there would be more than enough to give every man, woman, and child in our country a pound and a half. Much of the best mackerel comes from Canada, and an army of fishermen is engaged in catching herring in nets, and in smoking, pickling, or curing them in other ways, for the markets of the world.

XLII. THE CITIES OF CANADA.

THE Dominion of Canada includes the whole of British America except Newfoundland and Labrador. Of the five million people who inhabit this vast territory, almost all live near the extreme southern edge of the country. We can take a flying railroad trip from west to east, and visit almost every large Canadian city on the way. We start at Victoria, on the island of Vancouver. This is the capital of British Columbia. It lies on a beautiful harbor overlooking the Straits of Juan de Fuca and the Gulf of Georgia. It has only about twenty thousand people, and we are surprised to see many Japanese and Chinese, who have come here on the steamships which stop at Victoria on their way from China and Japan to Vancouver.

Within two miles of the city is the chief naval station of Great Britain on the Pacific Ocean. It is known as

Esquimalt. We visit it, going thither on electric cars, and look at the British men-of-war which lie in its harbor. There is an immense dry dock at Esquimalt, in which the war vessels are cleaned of the barnacles that gather on their hulls. There is a man-of-war lying in it at the time of our visit, and we watch the men scouring and scraping to get the ship clean.



Dry Dock — Esquimalt.

From Victoria we go by steamer to Vancouver. The trip takes about half a day. We cross the Gulf of Georgia, ride under the shadow of the white cone of Mount Baker, and come to anchor at the chief commercial port of Great Britain on the Pacific. A steamer which has just come from Asia is lying beside us, and we watch the men unload packages of tea and other goods from China and Japan, and put them into the cars of the Canadian Pacific Railroad, which is to carry them to the East.

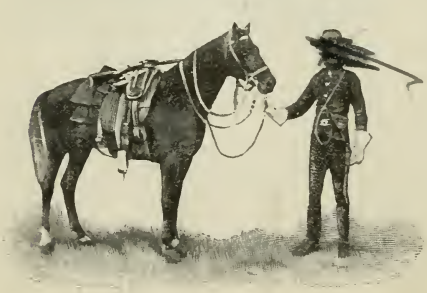
It is by the Canadian Pacific that we shall journey from one side of Canada to the other. There is a train every day; but we feel tired at the thought that the iron track in front of us goes on and on, without stopping, for a distance of twenty-nine hundred miles toward the sunrise. We travel for miles through country which is heavily

wooded, the fir trees in some places rising to a height of three hundred feet. We skirt the Fraser River, whose sands are said to contain much gold dust, and go on until we find ourselves in the heart of the Rockies. We rise higher and higher, passing through some of the grandest scenery in the world. We fly past glaciers. We ride for miles in the snow, and then shoot down the sides of the mountains to the lower slopes, which are covered with a dense growth of green.

The first large town east of the Rockies is Calgary, a little city of about five thousand people, which is a supply point for the cattlemen who graze their herds in the country near by, and also for the miners who work in this part of the Rockies.

Going on eastward, we pass through miles and miles of grazing land, getting a view now and then of an antelope in the woods, and passing, here and there, prairie-dog villages at the side of the track.

We stop at Regina. This is a little town of about three thousand people. It is the capital of the Northwest Territory, and is noted as being the chief station of the mounted police. The mounted police is a military organization of a thousand soldiers, whose business it is to look after the Indians and keep order everywhere in the vast region of the western Canadian frontier. They have fine horses which can gallop immense distances in a very short time.



Mounted Police.

Farther east we find rich farming lands, the soil of which will raise excellent wheat; and at Winnipeg, after a car ride of fourteen hundred and eighty-two miles, we stop at one of the great wheat and grain centers of the world. There are immense elevators here. Winnipeg is the capital of the rich wheat province of Manitoba, which raises millions of bushels of grain every year, forming a continuation of the bread lands of the Red River Valley, which we visited after our trip up the Mississippi Valley.

Winnipeg has now about forty thousand people. It commands the vast trade of the regions to the north and west. Through Lake Winnipeg, and the Saskatchewan, Assiniboine, and Red rivers, it is the trading point for a large extent of territory. A railroad has been planned to go from Winnipeg to Hudson Bay. Should this be built, ships could come from Europe during the summer through Hudson Strait, could cross Hudson Bay, and be within a few hundred miles by rail of the great wheatfields of the Canadian Northwest. If this is done, Winnipeg will be the Chicago of Canada.

Leaving Winnipeg, the cars rapidly take us to Port Arthur, on Lake Superior, and thence we go on through a wild, broken region, crossing many rapid rivers, and skirting numerous lakes. We are seldom out of the woods, and the extensive forests of Canada grow upon us as we ride farther east, through little else than trees, until, about thirteen hundred miles from Winnipeg, we reach Ottawa.

Ottawa is the capital of Canada. It is a beautiful city. It is only about one sixth as large as Washington, and, like Washington, it was cut out of a forest. It is situated on a high bluff at the junction of the Rideau and Ottawa rivers; and as we walk through its wide streets, we can hear the murmur of the Chaudière Falls, which

here break the navigation of the Ottawa River, giving water power for numerous sawmills and factories.

Parliament Buildings — Ottawa.

At the highest part of the city, almost overhanging the Ottawa River, are the Parliament buildings, where the laws for Canada are made; and near them are the great department buildings, in which the government of the Dominion is directed.

It is at Ottawa that the governor-general of Canada lives. He is appointed by the ruler of England, and receives a salary of ten thousand pounds, or about fifty thousand dollars, a year. He has a number of advisers, or cabinet ministers, much as our President has, and it is his business to carry out the laws of Canada as enacted by the Parliament.

The upper house of the Canadian Parliament is quite

different from our Senate. The Canadian senators are chosen for life, ours for six years. Each province of Canada has the right to a certain number of senators, but the men are selected by the governor-general instead of being chosen by the people or legislature, as with us.

The House of Commons is somewhat like our House of Representatives. Its members are elected by the people. Each representative receives one thousand dollars a session, or about one fifth as much as one of our congressmen receives; and if he be absent he is fined eight dollars a day for the time he is away, unless his absence is caused by sickness. Parliament fixes the taxes of Canada, and all the money collected for taxes is spent in Canada, and not, as was the case with our colonies before the Revolution, sent to Great Britain.

Each of the provinces of Canada has a government somewhat like that of our states; but Parliament deals with the whole of the Canadian Dominion, and not with any special province.

The two largest cities of Canada are Montreal and Toronto. Toronto is a thriving port on Lake Ontario. Montreal is on the St. Lawrence River, three hours by rail from Ottawa; or we can reach it by a sail down the Ottawa River in the steamers which go every day from one city to the other.

Montreal is the New York of Canada. It is its chief commercial city, and also its chief seaport. It is situated on an island formed by the junction of the Ottawa and St. Lawrence rivers. Formerly the ocean steamers coming to Canada had to stop at Quebec, because the St. Lawrence between that city and Montreal was only eleven feet deep, and this was not deep enough for large ships. In 1851, however, the river was dredged out, so that there

Wharves at Montreal.

is now a channel more than twenty-seven feet deep all the way from the Atlantic Ocean to Montreal.

We find the largest of ocean steamers at the wharves of the city, and see immense cargoes of grain, which have come down the Great Lakes and through the Welland Canal, being put into steamers to be carried to Europe.

Just back of Montreal there is a high hill known as Mount Royal. Let us go to the top of it and take a view of the city. We ride up on an inclined railway, and feast our eyes on some of the most beautiful scenery in America. Montreal, with its quarter of a million people, lies below us, covering a long space on the banks of the

beautiful St. Lawrence. Here and there, among the houses, rise the spires of great churches; and many beautiful parks and lines of shade trees are to be seen. There, in front of us, we see Victoria Bridge across the St. Law-

Victoria Bridge.

rence, which, when it was built in 1860, was considered the most wonderful bridge in the world. It is made of wrought-iron tubes, so fitted together that they form a rectangular pipe about two miles long, and so wide and high that a railroad train can easily pass through it. The bridge belongs to the Grand Trunk Railway.

The stone pillars of the Victoria Bridge are so built that their upper sides extend out into the river in the shape of great plowshares. The object of this is to cut the ice as it rushes against them in the spring.

The St. Lawrence is frozen during the greater part of the winter. The snow falls very heavily in Canada, and for a number of years Montreal has had a winter festival, during which the people have built a great palace of blocks of ice, which many strangers have come thousands of miles to see.

Both here and in many other parts of Canada the win-

ter forms the jolliest part of the year. The snow lies upon the ground for months. There are skating, snowshoeing, and tobogganing. Every city has its skating rinks, many of which are lighted by electricity. Every town in Canada has its snowshoe club, and in the cities there are numerous snowshoe organizations. Each club has its own uniform, consisting of a bright-colored blanket coat, and a cap, or cowl, fastened to the neck and fitting over the head. The clubs go out and run over the snow, playing games in the moonlight. They sing as they play, and the sight is a most curious one.

Tobogganing.

Tobogganing is enjoyed by men, women, and children. A toboggan is a thin piece of board about eighteen inches wide and from four to eight feet long. The board is turned up at the front end. It has a very smooth bottom, and when placed on the edge of a hill, with one or more passengers seated upon it, it will rush over the glassy snow with the speed of an express train. The steersman of a toboggan sits in the rear. It is his business to direct the course of the board with his hands and feet. He sometimes makes a mistake, and turns himself

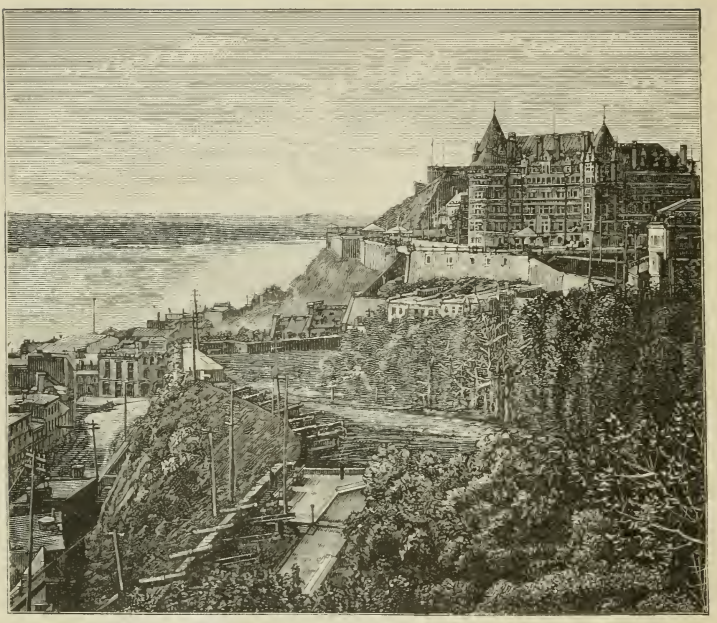
and the others, seated in front of him, upside down in the snow.

In our travels through the eastern part of Canada, we are surprised to find that a large portion of the people are French. There are more French than English in Quebec, and more than one third of all the Canadians are of French descent. We hear little else than French spoken on the streets of Montreal. In the government offices papers are printed in both French and English, and the signs in the streets are in both languages. The markets of the cities of eastern Canada are supplied with vegetables by French-Canadian farmers, and we talk with the marketmen in French.

The eastern part of Canada belonged for a long time to France. Then there was a great war between France and Great Britain, and in 1759 the British, under General Wolfe, climbed to the heights upon which the city of Quebec is built, and captured this well-fortified town.

Quebec is called the Gibraltar of America. It is situated upon a rocky bluff three hundred feet above the St. Lawrence, and it has many cannon which guard this waterway from the sea into Canada. There are forts on the heights on the opposite side, so that it would be a dangerous thing for a foreign battle ship to attempt to pass here on its way up the St. Lawrence.

We steam down the beautiful St. Lawrence from Montreal in a night, and find ourselves at the wharves of Quebec in the morning. The place where the battle between the French and English was fought lies just back of the city, on the Plains of Abraham; and our guides tell us how both of the generals were killed during the engagement. General Wolfe fell dead on the field, having been hit three times, the last ball piercing his breast. Montcalm,

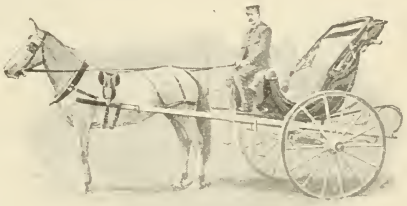


The Citadel—Quebec.

the French general, was first struck by a musket ball, and then by a discharge of the only cannon that the British had brought to the field. He was carried, mortally wounded, into Quebec, and at five o'clock the next morning he died. All this happened on September 13, 1759. It marked the end of French rule in North America.

The city of Quebec contains about seventy thousand people. It is more like an old French town than a modern American city; and as we wander through its narrow streets we can hardly believe that the town belongs to our pushing North American continent. The favorite mode of conveyance between different parts of the city is by calashes, peculiar two-wheeled, one-horse vehicles, which

can be hired at the livery stables for seventy-five cents an hour. Dufferin Terrace, a grand promenade along the edge of the cliff two hundred feet high, affords one of the finest views of river and mountain scenery in the world. The citadel of Quebec is a very strong fortification covering nearly forty acres of ground.



A Calash.

We make but a short stay in Quebec, and then take the railroad for Halifax, the capital of Nova Scotia, where there are other fortifications, and where the chief naval station of British America is situated.

Halifax has about thirty-five thousand inhabitants. It has an excellent harbor. Here are ships from many parts of the world at its wharves, and we have little trouble in finding a vessel which takes us to Boston. From that point we go by rail to New York, to take the line of steamers which, in five days, carries us to Vera Cruz, the chief seaport of Mexico.

XLIII. SPANISH NORTH AMERICA—MEXICO.

MEXICO is within a few days' ride of any part of the United States, but as we land in Vera Cruz, we seem to be in another world. The faces of the people are darker than ours. They speak Spanish, and we must have a Mexican guide who understands English to take us about. Many of the men wear hats with brims a foot

wide, and bands of silver and gold as thick as your wrist. Not a few have on jackets, or short coats, embroidered with silver braid, pantaloons the legs of which are ornamented with silver buttons, and leather belts from which silver-mounted revolvers hang. The dress of the women seems strange. The ladies we see on the streets wear black, and some have shawls over their heads, like those worn by the women of Spain.

A Mexican.

The poorer people are dressed in cotton. They have features somewhat like those of our Indians; but they are shorter in stature, and do not look so strong. Nearly all of the men wear big hats, and not a few have red blankets which they drape picturesquely about their shoulders. The women wear cotton dresses, and have shawls on their heads in place of hats or bonnets.

What queer houses we see in the towns! They are flat-roofed, and very few of them have chimneys. The people use charcoal for cooking, and Vera Cruz is so hot that you do not need a fire to keep warm. How gay the walls look! They are painted red, yellow, or bright blue. They extend to the edges of the sidewalks, and the windows of the ground floors have iron bars like those of a prison.

How beautiful the flowers and trees are! We are now in the land of the tropics. There is a palm tree; and that long-leaved plant beside it is loaded down with bananas.

We are now in what is known as Spanish North Amer-

MEXICO
SCALE OF MILES
0 50 100 200 300 400 500
110
100
90
80
30
20
Longitude West from Greenwich
UNITED STATES
MEXICO
GULF OF MEXICO
PACIFIC OCEAN
ATLANTIC OCEAN
CARIBBEAN SEA
CENTRAL AMERICA
CAL.
ARIZONA
NEW MEXICO
INDIAN TY.
ARK.
MISS.
ALABAMA
GEORGIA
S.CAR.
Atlanta
Savannah
Jacksonville
FLORIDA
Mobile
LOUISIANA
New Orleans
Galveston
Dallas
Austin
San Antonio
El Paso
Juarez
Rio Grande
Red
Pecos
Mississippi
TEXAS
SONORA
HERMOSILLO
Guaymas
CHIHUAHUA
Conchos R.
Monclova
COAHUILA
NUEVO LEON
MONTEREY
Matamoros
DURANGO
SALTILLO
CULIACAN
LA PAZ
Mazatlan
C.San Lucas
Gulf of California
LOWER CALIFORNIA
SINALOA
ZACATECAS
SAN LUIS POTOSI
TAMAULIPAS
Tampico
Progreso
Gulf of Campeche
Tuxpan
Vera Cruz
Tropic of Cancer
Key West
Florida Str.
ANDROS IS.
BAHAMA ISLANDS
Nassau
HAVANA
C.Catoche
Yucatan Channel
Puerto Principe
Santiago de Cuba
HAITI
JAMAICA
KINGSTON
COZUMEL I.
MERIDA
YUCATAN
CAMPECHE
TABASCO
CHIAPAS
SAN CRISTOBAL
Belize
Gulf of Honduras
C.Gracias a Dios
Tuxtla
Tehuantepec
Gulf of Tehuantepec
Tegucigalpa
San Salvador
Bluefields
Acapulco
OAXACA
CHILPANCINGO
GUERRERO
MICHOACAN
COLIMA
JALISCO
Manzanillo
C.Corrientes
L.Chapala
GUADALAJARA
LEON
GUANAJUATO
QUERETARO
HIDALGO
PACHUCA
MEXICO
TOLUCA
PUEBLA
JALAPA
V.Orizaba
V.Popocatepetl
TLAXCALA
SAN JUAN BAUTISTA
TABASCO
REVILLAGIGEDO IS.
BRADLEY & POATES, ENGR'S, N.Y.

Straw Cottages — Mexico.

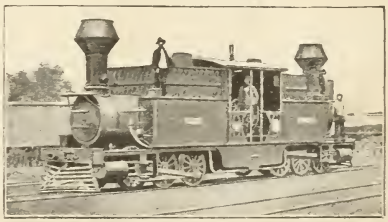
ica. All the country between the United States and the Isthmus of Panama belonged for centuries to Spain. The Spaniards came across the Atlantic and conquered the Indians, and divided up the land among themselves. Some of the Spaniards married Indian women, and to-day Spanish North America is inhabited by the descendants of the Spaniards, by those of the Spaniards who married the Indians, and by the descendants of the Indians who lived here at the time Columbus discovered America. The different countries, however, long ago rebelled against Spain. They now have their own governments.

Mexico is almost one fifth as large as the whole United States, including Alaska. Take your map of North America, and see how the country is shaped. Does it not look much like a great horn, the roots of which are fastened to the United States, and the tip ending in Yucatan on the coast of the Caribbean Sea?

Mexico is formed like a horn also, in that it slopes very steeply upward on both sides from the sea, its top forming a high, irregular plateau, which lies, in most places, more than a mile above the surface of the Gulf of Mexico or the Pacific Ocean. It is on the inner curve of the horn that we land at Vera Cruz; and as our cars climb up the railroad from the coast to the plateau, we get some idea of the many climates Mexico has.

Along the coast it is exceedingly hot. It is unhealthful here during a great part of the year, especially in the rainy season, when the water falls in torrents. We ride for miles through groves of palm trees, on the tops of which bunches of cocoanuts hang. We pass thickets of bamboo canes, whose feathery branches extend high above the roofs of the cars. Here are mahogany trees and ebony trees; and there are vines bearing vanilla beans, from which comes the extract we use in flavoring ice cream, soda water, and cake.

The forests are full of curious flowers; hundreds of orchids, or airplants, hang to the branches; and there are so many of these choice blossoms that we could have a carload for the picking. There are birds of bright colors flying about through the trees, and the mocking birds whistle at us as we go by.



A Double Engine.

We soon reach the hills, and begin to go upward. The ascent is so steep that a double engine is needed. We rise in one place a thousand feet in twenty miles, and in another we

go upward four thousand feet in twenty-nine miles. The engine puffs and groans as it pulls us about the sides of the mountains, dragging us through tunnel after tunnel, hauling us over iron bridges, now twisting this way and now winding that, until at last, after having dragged us more than a mile and a half above the sea, it lands us at Esperanza, at the beginning of the plateau which forms the greater part of Mexico.

In our trip upward we have gone through a half-dozen different climates. We first rode through groves of orange and lemon trees. We passed by fields of pineapples, the red roots or bodies of which shone out below the green leaves against the dark ground. Pineapples, we learn, grow much like cabbages, and those which the Indian women bring to the cars, fresh and ripe from the fields, are far more delicious than any sold in our markets.

A little farther on we passed through what we at first thought were banana plantations. The fields were filled with the tall, wide-leaved banana plants, but between them were bushes covered with dark-green leaves, and filled with bright red berries, each about as big around as a small chestnut. We saw Indians picking these berries, and were told that they were gathering coffee, and that each of the berries contained two of the seeds which form the coffee of commerce.

When we ask as to the bananas, we learn that they are planted to shade the coffee bushes, and that the coffee is by far the more valuable product. Coffee plants are first grown from the seed in nurseries. They are then set out in the field and are cultivated. At the age of five years they produce bountiful crops; they continue to yield for about ten years, each bush giving from one to five pounds of coffee a year. After the berries are gathered, they are

Drying Coffee.

crushed to get the hulls from the seeds, and the seeds are then dried and cleaned for the market. Some of the best coffee of the world is raised in Mexico, and there are large plantations in those parts of the country lying between the plateau and the sea.

The most of the Mexican plateau is too cool to produce tropical fruits. Its climate is a temperate one and exceedingly healthful. The weather the year round is much like that of an Ohio June.

The tops of the mountains along the borders of this great tableland are covered with perpetual snow. The air is so pure that we can see many miles. The sky seems closer to the earth than at home, and at night the moon shines with a greater brilliancy, and the stars are more than ever like diamonds.

It is on the Mexican plateau that most of the people live. There are railroads which connect the larger cities, many of which are more than a mile above the sea. In the northern part of Mexico the plateau has many

deserts like those we saw among the Rockies on our way to San Francisco. Here the only plants which grow are the cacti and the sagebrush. The ground is white and glaring, and as we cross the deserts on the railroads, our eyes grow sore and our nostrils are filled with a suffocating dust.

The surface of the plateau is rolling. Out of it rise many mountains containing gold and silver. It has rich valleys and well-watered plains, many of which are divided up into enormous farms called haciendas.

What would you think of traveling for eighty miles on a railroad through one man's farm? There are haciendas even larger than that in Mexico, upon which great herds of cattle, droves of horses, and flocks of sheep and goats are pastured. There are plantations farther south upon which vast crops of tobacco and cotton are grown; and wheat, corn, and barley can be raised almost anywhere upon the watered parts of the tableland.

There are few countries where crops grow so luxuriantly as in Mexico. The farmers use the poorest of tools. Many of the plows are forked sticks shod with iron, which merely scratch the surface of the ground. Still, some of the land is so rich that it will produce two crops a year, and I have seen men harvesting in one field while the same kind of crop was being planted in the field adjoining. We can pick roses almost anywhere in Mexico from January to December; and should we ride north from Mexico city, we would pass through sections of the country where strawberries are ripe all the year round.

In our travels we see many curious plants. The cactus grows everywhere upon the highlands. There are many species of cacti in Mexico, some of which are very valuable. You may have seen century plants in the hothouses

of the United States. There is a species of this plant family which grows best in Yucatan. It is known as henequen, or Sisal hemp, and is of great value on account of its fibers. The cactus leaves are composed of long threads, or fibers, which, when prepared, can be used for the making of hammocks, bagging, or ropes. Many of the hammocks we use in America are woven by the Indian women of Yucatan.

There is another species of cactus which grows near Mexico city, the juice of which, if kept a few days, turns into a beer which the natives greedily drink. This species is the maguey plant. We pass through vast plantations of maguey on our way to the Mexican capital. The full-grown plants are so big that you could not crowd the smallest of them into a hogshead. They have leaves from six to eight inches thick, which sprout up from the ground to the height of ten or twelve feet. Inside the leaves there is a green cone as big around as a peck measure; and when the plant is ripe, this cone is cut out, leaving a bowl which will hold about two gallons.

Maguey Plant.

Into this queer bowl the sap runs down from the leaves in streams, each plant producing from eight to fifteen quarts of juice every day; and as this yield will con-

tinue for six months, you can see that a single plant will produce several barrels of liquor. The juice is quite sweet at first, and it is as clear as spring water. It begins to ferment in a very few hours, and within a day it has turned to beer, and will make you drunk if you take too much of it.

XLIV. TRAVELS IN MEXICO.

WE remain some time in the city of Mexico, and from there take trips by rail and stage to different parts of the country. Mexico has now thousands of miles of railway, reaching all parts of the plateau and the harbors on the east and west coasts. The most of these roads have been recently built, and we can travel through many sections of country which until now have been almost unknown to the rest of the world. There is good order everywhere, and we cannot see why so many Mexicans should carry revolvers. It is because the country for years was filled with brigands, and it was then not safe to travel alone. Now, however, there is peace everywhere, and we ride on donkeys for miles through the mountains.

We can get a good idea of the cities of Mexico by a look at the capital. The best view of Mexico city can be had from the spire of the great cathedral which stands in its center. Let us climb to the top, and take a bird's-eye view of the city. We are now two hundred feet above the ground, looking down upon one of the most picturesque cities of North America. The Mexican capital lies in a beautiful valley surrounded by mountains. Off in the distance, the two great volcanoes of Popocatepetl and the White Woman look down upon us out of their caps of

The Cathedral — City of Mexico.

perpetual snow; and the green fields of the valley are spotted here and there with lakes, which shine like great shields of diamonds under the bright rays of the southern sun.

The city below looks like a checkerboard. It is divided into squares of houses roofed with brick, and the streets which bound the squares are of cobblestones. As we look down, we see that the roofs of all Mexican houses are flat. There is not a bit of smoke rising from them. There are not a dozen chimneys in the whole city, for the houses are heated with charcoal, and the cooking is done with the same fuel in little clay ovens. There are few furnaces in Mexico, and iron cooking stoves are almost unknown.

On the tops of many of the houses we see white and gay-colored patches floating to and fro in the breeze.

These are the family washings, which are often dried upon the roofs. Farther out upon the edges of the canals, at the outskirts of the city, there are other patches of white; and you see that much of the washing of Mexico is done in the streams, the most of the clothes being washed in cold water.

Notice how the houses are built. Few of them are more than three stories in height. They stand close to

General View of the City of Mexico.

the sidewalks, around little courts which form yards or gardens. Every large Mexican house has a court of this kind. There are flowers and trees growing in it.

Just below us, in front of the cathedral, there is a large square, known as the plaza, where the band plays every evening, and where the people come to walk about under the trees. Such plazas are to be found in every Mexican city. The people are fond of music, and they spend much time out of doors. That long three-story building at the

side of the plaza below us is the National Palace, where the Congress of Mexico sits, and where the officers of the government work. Mexico is a republic much like the United States. It is in that building that the President receives his callers; and about him, in other rooms, are the chief offices of the government departments.

What a number of churches there are, rising out above the rest of the houses! All Mexican cities have fine church buildings. The chief religion of the people is Roman Catholic, and for years the church owned a vast deal of all kinds of property. Some time ago, however, the government thought that the church had too much influence upon the people. It therefore confiscated many of the church buildings; and we shall see old monasteries and convents that are now used for public schools. Some have been sold for factories, and others for hotels.

But let us go down from the cathedral and take a walk through the city. It is now just after noon, and we find the streets almost deserted. The Mexicans close their stores at twelve o'clock, and rest during the hot hours of the day. They have their dinners between twelve and one, after which they take a nap or chat with their families until three, when they come back to work. The business hours are, in fact, from nine to twelve in the morning, and from three to six in the afternoon.

By seven o'clock most of the establishments are closed, and the evening is given up to rest or to pleasure. After seven the poorer people go out to walk in the parks, and those who have carriages drive out upon the Paseo, the wide road which runs between the city and the great hill called Chapultepec, on which is the summer home of the President.

We are surprised to see how many poor people there

Chapultepec.

are. There are hundreds of thousands who work for a few cents a day, and there are thousands of families supported in Mexico on less than a dollar a week. The Spaniards and the mestizos, or the descendants of Spaniards and Indians, own the greater part of the wealth. The Indians, of whom there are several millions, and the poorer of the mestizos, form the laboring class. They get in debt to their employers, and work on from year to year, taking only a part of their wages from day to day, and allowing the remainder to go toward the payment of that which they owe. They borrow more from time to time, and thus keep themselves all their lives in a sort of debt slavery. Such slaves are known as peons, and the poorer classes of Mexico are generally called peons.

We see many peons in Mexico city. The men dress, as a rule, in white cotton shirts and pantaloons. The shirt is outside of the pantaloons, and the pantaloons fall to the feet. The peon does not wear stockings. His

feet are shod with sandals of thick leather. He wears a broad-brimmed hat with a crown a foot high, and a red blanket, which he throws about his shoulders. The peon woman usually goes barefooted and bareheaded. Her dress is of cotton, and her only additional garment is a shawl, which she drapes around her shoulders and sometimes draws over her head.

We see many of the peons in the market. They bring vegetables, eggs, and other things on their backs from their little farms miles away from the city. They squat down under umbrellas, and, with their wares piled up before them, offer them for sale.

Indian corn forms the chief food of the people. The most of the people of Mexico do not know what bread is, and hundreds of thousands have never tasted wheat flour. There are vast numbers who have never had meal ground in a mill. Every peon woman is her own cook and her own miller. Outside of almost any Mexican hut we can see a woman preparing her Indian corn for food. She

Making Tortillas.

Hut of a Peon.

does this by means of two stones. One is a rough slab about a foot wide and eighteen inches long, and the other is a round stone such as we use for whetting scythes. The woman first soaks the grains of corn in limewater until they are soft. She then lays them on the slab, and, getting down on her knees behind it, rubs them with the round stone into a paste or dough. She presses this with her hand into the shape of a griddlecake, and then lays it upon a charcoal fire to cook; and in a short time the bread for the family is made. These cakes are called tortillas. We taste them, and find them quite good. The peons eat them without butter, though they sometimes use salt and red pepper for seasoning them.

There is one dish that we shall find well served in every Mexican house. This dish is black beans, which the Mexicans call frijoles (fre-o'les). Frijoles are eaten by both the rich and the poor. It is not an uncommon

thing to have them brought in at the close of the meal.

The Mexicans have very good candies, and you will find delicious chocolate everywhere. At noon the better classes have a good dinner, each dish being brought in and served separately, and not all at once as with us. None but the rich can afford meat, and in some cities the way meat is sold makes us think that it would be dear at almost any price. I once saw a butcher peddling beef in the Mexican city of Guanajuato. His meat wagon moved about on legs instead of wheels. It was a dirty, one-eyed mule. Upon the mule's back there was a framelike saddle covered with hooks. The pieces of meat hung from the hooks down the sides of the animal, the blood from them dripping to the ground as the mule walked along.

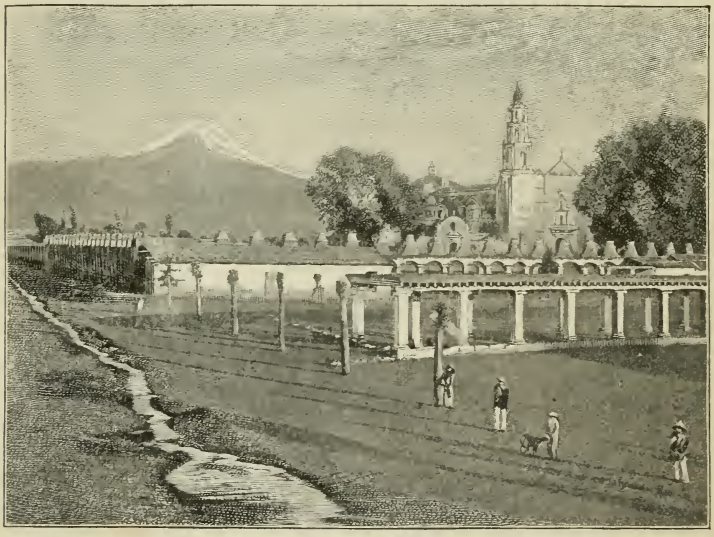
The mountain districts of Mexico are among the most interesting parts of the country. Since the discovery of America, much of the silver of the world has been taken from the Mexican mines, and there are mines here which have produced tens of millions of dollars' worth of silver.

The Mexican Indians had vast quantities of gold and silver when the Spaniards conquered them. Montezuma, the Indian emperor, gave Cortés, the Spanish general, plates of gold and silver as big as wagon wheels, and his people made spurs of gold for the Spanish horsemen. To-day more than one thousand mines are being worked in Mexico, and more than two hundred thousand men are employed in getting out the precious metals.

But before we leave Mexico we must see a volcano. Mexico has a number of these wonderful mountains, which now and then vomit forth lava, steam, and sulphur. We can see Popocatepetl from any part of Mexico city, and we resolve to climb it.

Popocatepetl is one of the greatest volcanoes, and it is one of the highest mountains on this continent. It is more than seventeen thousand feet high, or more than three miles above the level of the sea. We ride over a railroad to the town of Ameca Meca, which lies at the foot of the mountain. Here we take guides, who carry our overcoats for us. We each have a stick to keep us from falling, and the guides have ropes to help us over the icy and rough places.

For the first few hours we go through a pine forest. Then we climb up hills of volcanic rock, through loose,



Popocatepetl.

shifting, black sand. As we rise higher, the trees are smaller, and at last we come to a point where nothing at all grows.

We soon reach the snow line, where, from year's end

to year's end, the snow never melts. The snow is soft at first, but as we rise it becomes harder and harder. The air grows colder and thinner, and at times we feel a little faint and sick. How our hearts beat! The glare of the hot Mexican sun on the snow dazzles our eyes, and our hands are torn in pulling ourselves from point to point over the ice. At last we reach the top, and stand at the edge of the crater of the greatest volcano in North America.

Popocatepetl is not now throwing stones, rock, and lava into the air, but it is always vomiting out fumes of sulphur. We have to get to the windward of the volumes of blue-and-yellow brimstone smoke which rise out of the great hole in the top of the mountain, and then we can look down within. The top of the crater is almost a mile wide, and the hole is more than one thousand feet deep. The walls slope inward as they go down, and by peeping in we can see scores of Indians at work gathering the sulphur and carrying it to the top. From there it is slid down the mountain in a sort of trough, or chute, to be prepared for the markets. The sulphur of Popocatepetl is said to be the purest in the world, and a great quantity of it is taken out and sold every year.

XLV. CENTRAL AMERICA.

TO-DAY we leave Mexico for a trip through Central America. In going from the southern boundary of Mexico to the Isthmus of Panama, we have to travel almost as far as from New York to Chicago. The journey requires several days if taken by sea; and should we go the whole way by land, we would be months in getting from one point to the other.

CENTRAL AMERICA
AND
WEST INDIES
SCALE OF MILES
0 50 100 200 300 400
BRADLEY & FOATES, ENGR'S, N.Y.
Longitude West from Greenwich
90
80
70
GULF OF MEXICO
CARIBBEAN SEA
PACIFIC OCEAN
ATLANTIC OCEAN
GREATER ANTILLES
LESSER ANTILLES
BAHAMA ISLANDS
SOUTH AMERICA
Matamoros
Key West
Florida Strait
Tropic of Cancer
Tampico
Tuxpan
Gulf of Campeche
Vera Cruz
Jalapa
Oaxaca
Progresso
Merida
Campeche
C. Catoche
Yucatan Channel
C. San Antonio
Cozumel I.
Isla de Pinos
Cienfuegos
Havana
Matanzas
Nassau
Andros I.
Gr. Bahama I.
Gr. Abaco I.
Eleuthera I.
Cat I.
San Salvador or Watling I.
Long I.
Acklin I.
Mariguana
Caicos I.
Turks I.
Gr. Inagua I.
Puerto Principe
Santiago de Cuba
Cape Haitien
Windward Passage
Puerto Plata
Haiti
Santo Domingo
Port au Prince
Mona Passage
San Juan
Puerto Rico
Ponce
St. Croix
St. Christopher
Anguilla
Barbuda
Guadeloupe
Dominica
Martinique
St. Lucia
St. Vincent
Grenada
Pt. Negril
Jamaica
Kingston
C. False
Belize
Gulf of Honduras
Puerto Cortez
Trujillo
Guatemala
Quezaltenango
New Guatemala
Santiago
Honduras
Tegucigalpa
C. Gracias a Dios
San Salvador
G. of Fonseca
Coco
Nicaragua
Leon
Managua
L. Nicaragua
Bluefields
San Juan del Norte
(Greytown)
Costa Rica
Punta Arenas
Limon
San Jose
G. of Nicoya
G. of Dulce
Chiriqui
Bay of Panama
Panama
C. Mariato
Colon
G. of Darien
Cartagena
Maracaibo
L. Maracaibo
C. Gallinas
Aruba
Buen Ayre
Curacoa
Tortuga
La Guaira
Caracas
Puerto Cabello
Margarita
Trinidad
Medellin
Socorro
Bogota
Orinoco R.

Central America is not thickly populated. It has not, in all its states together, as many people as there are in the city of New York. The people are much like the Mexicans, save that there are more Indians among them. The country is not unlike Mexico, with tropical lowlands and a strip of plateau, upon which are high volcanic mountains. In the mountains we see men and women at work mining gold and silver. In some places the Indian women are washing gold out of the streams.

The climate of Central America is hotter than that of Mexico. It grows warmer and warmer as we go southward, and on the lowlands the vegetation becomes more and more tropical.

We find excellent coffee lands in many of the states. In

A Banana Plantation.

Honduras we visit plantations where vast quantities of bananas are raised for the American markets. The plants are started from suckers pulled from the banana plants already grown. The suckers are set in the earth about fifteen feet apart. They grow rapidly, soon reaching a height far above your head, and spreading out their long, wide leaves. At the age of ten months the first fruit can be gathered. Large bunches of green bananas now hang down from the stalks of the plant. They are pulled down almost to the ground, and then the stalk is cut next to the fruit with a long knife. The bananas are cut when they are green, and put upon shipboard for export. It takes several days for them to reach our markets, and they have time to ripen during the voyage.

Another product of Central America which finds its way to all parts of the United States is chocolate or cocoa. It is made from the seeds of the fruit of the cacao tree, which is cultivated in Mexico and Central America. The tree is planted just as we plant peach or apple trees. It is carefully cared for, and after a few years it bears a red or green fruit, about eight inches long, in which are the seeds known as chocolate nuts or cacao beans. The seeds are very oily, and they are allowed to ferment before they are dried. They are ground up into a powder, some of the oil being taken out in the process of preparation. The powder, pressed into cakes, forms the chocolate which is sold in our stores.

Much of our journey in Central America must be through the forests. No other part of the grand division has such dense woods as are found here. The trees grow to a great height and thickness. They are bound together by snakelike vines, and the vegetation is so dense that in

passing through the woods it is impossible to advance more than a few miles each day.

Travel is quite dangerous in the forest regions. There are many poisonous snakes. There are centipedes, scorpions, vipers, and all sorts of horrible creeping things. We see many wild beasts. There are panthers and jaguars. There are herds of peccaries, or wild hogs; and monkeys by the hundreds jump from tree to tree. There are humming birds not much larger than bumblebees. There are wild parrots and other birds of the most gorgeous plumage.

Here and there, in the woods, we find lumber camps, where men are cutting down mahogany, ebony, and rosewood trees, to be shipped to all parts of the world for

A Hut in Central America.

making furniture. The camps are usually on the banks of a river, the lumber being dragged by oxen to the stream, and floated down to the seacoast. A mahogany camp consists of a collection of log cabins, in which from thirty to fifty men live and work, under an overseer called a captain. There is one man among them, who is known as the hunter, who goes through the forest and picks out the trees fit for cutting. This man knows a mahogany tree as far as he can see it, and he understands just how large it should be to make good lumber.

The mahogany grows to an enormous size in Central America, the trunks of some trees being sixty feet high before the branches begin. At certain times of the year the leaves of the mahogany are colored as brightly as the leaves of our forests in autumn. It is this color which forms the guide to the hunter, who, having climbed to the top of some high tree, picks out with his eye the places where the mahogany trees are, and plans just how to get to them. No trees are cut down which are less than eight feet in circumference, and it has been calculated that a mahogany tree must be three hundred years old before it is ready for lumber. The wood is of such value that it brings high prices everywhere.

There are also India-rubber trees. These trees in Central America do not grow more than fifty feet high. Sometimes, in gathering the sap, the rubber trees are cut down. Sometimes they are left standing, and the bark is cut away in strips from the top of the tree to its roots. Holes are made in the ground at the ends of the strips, and these are so plastered with leaves that they make a bowl in which the sap is caught as it oozes out and rolls down. After the sap has been collected, it is allowed to harden, and is then kneaded into cakes for the markets.

The cities of Central America are few. All of them are small, and we find them not unlike the Mexican

Native Shop in Guatemala.

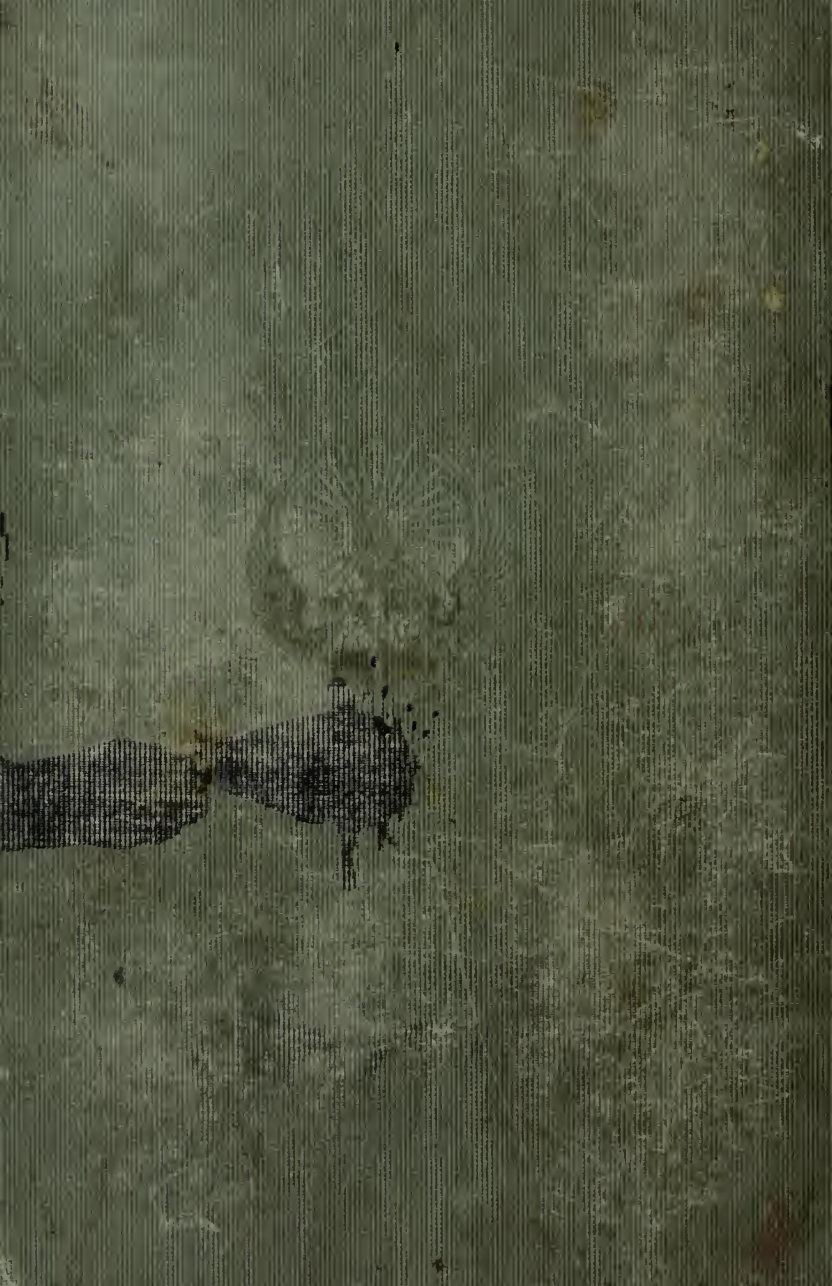
towns we have visited. Many of them are back from the sea, and few of the interior cities can be reached by railroad from the Pacific coast. But there are a number of good harbors along the coast.

As we near the Isthmus of Panama we find that the country grows more and more narrow, until, at the town of Panama, the distance between the Pacific coast and that of the Caribbean Sea is only forty-five miles. Is not this a narrow strip of land which ties the two divisions of America together?

Yes, indeed; but, with its rough highlands, it is big enough to form a great barrier to the east and west commerce of the world. Could we sink the Isthmus of Panama or a slice of Central America under the sea, ships, in going from New York to San Francisco, would not have to sail round South America, a distance of more than eight thou-

sand miles would be saved, and Asia would be several weeks nearer our Atlantic coast and Europe.

The Proposed Nicaragua Canal.

The advantages of such a route are so great that plans have been formed to make canals through the Isthmus of Panama, and through that part of Central America, farther north, in which Lake Nicaragua lies. Lake Nicaragua is about half the size of Lake Ontario. It has an outlet to the Caribbean Sea through the San Juan River, and, by means of locks such as we saw at the St. Marys Falls, steamships might be lifted through this river into the lake, and thence, by a short canal, from the west coast of Lake Nicaragua down into the Pacific Ocean. Our government is much interested in this undertaking, and it is probable that the canal will sometime be completed.

At present, however, there is no chance to get across Central America by sea; so we take the little railroad that runs from one side of the Isthmus of Panama to the other, and within a few hours find ourselves at the town of Colon, on the Caribbean Sea. From this place we take a ship which lands us again in New York.